REPORT OF COMMITTEE ON

HISTORICAL BASIS, INVOLVEMENTS, AND VALIDITY OF THE OCTOBER 22, 1844, POSITION

PART V--CRUCIFIXION DATE, AND ASTRONOMICAL SOUNDNESS OF OCTOBER 22

A. The Problem and the Factors Involved.

Factor 1. In archaeological reports, in astronomy, theology, and history, the date of the death-year of Christ is a theme frequently discussed. It would appear that no generally accepted authority on the passion date, in either science or theology, exists today. Every discussion, however, in both astronomical journals and religious periodicals, reaches out for new evidence from the Bible. Early patristic testimony, fragments of ancient calendars on parchment or stone, ecclesiastical records which have survived the centuries, are still so wide apart in meaning that it seems virtually impossible to establish the crucifixion date from the standpoint of history alone.

There are related sources upon which constant demand is made by those considering the subject. These include the various calendars of the nations, their standard and local almanacs, the Jewish year book and system of keeping time, the ancient "boundary stones" and tablets with their revealing figures and difficult cuneiform, the dated business contracts of old Babylon, the Assuan papyri, various other ancient manuscripts, the prophecies of Daniel--for almost no chronologist, heathen or Christian, omits Daniel--and above all the New Testament record of the life of Christ.

In the endeavor to fix upon the crucifixion date, a year with a Friday passover in a period consistent with the time of the public ministry of Christ has for some time been the accepted index to the problem. This is the lead followed in the majority of current articles on the date of the crucifixion. But aside from the persistent stand of Catholic writers for April 3, 33 A.D.,[1] and of the Rabbins for a Friday passover in that year, none of late seem to draw a

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[1] Sidersky, David, "Astronomical Origin of Jewish Chronology," ch. II, par. 30, in "Memoires presentes par divers savants a l'Academie des Inscriptions et belles-lettres de l'Institut de France," Paris, 1913, Vol. XII, part 2; Boylan, Patrick, "Date of the Crucifixion," Studies, March, 1933, p. 1.

conclusion without an alternative date.

Factor 2. The variety of conclusions offered by these scholars may be charged to three principal causes:

a. The location of the paschal moon in the proper spring month;

b. The determination of the true day of the Hebrew first month, with which the full moon coincides; and

c. The number of passovers in the ministry of Christ.

Factor 3. It should be made perfectly plain that if these two coordinate facts concerning the passover moon--her position in the zodiac and her place in the month--are not definitely located, and pointed out with accepted authority, no astronomical list of new and full moon dates for the spring months of the suggested years of Christ's ministry can be of any use whatever in deciding this question. Nearly every writer builds his argument upon such a list. However, all these tables of the moon are practically the same, though taken from French, German, or English ephemerides (almanacs).

In the quest for solving the prophecies concerning Christ, some of these moon tables go back many centuries, covering 3000 years or more of time, and marking out the phases of the moon from year to year. The difficulty in calculation does not lie in an error in these dates which astronomy offers the student of prophecy and chronology, because they are in the main attested and correct. In fact, they can be easily computed and proved from known positions of the moon in our own century, by trailing her back through the one hundred cycles she has coursed around the earth since the first century A.D., from 1930 to 30 A.D.--and similar intervals of time.

Today we can learn from a standard almanac the moon's position in her orbit; when she is fast and when she is slow; when she is near the earth, and when she is far away; when north of the ecliptic--the apparent course of the sun--and when south. Her very same performance has been determined for the first century, and her position in the sky mapped out in the time of Christ. The difficulty, we

would emphasize, does not lie in a variation of these lunar tables which astronomy offers to the field of research in the twentieth century.

Factor 4. Before the cause of the numerous dates offered for the crucifixion can be understood--and the several years, 28 to 35 A.D., are by different writers considered possible--the early history of the change from Passover to Easter must be taken note of. Almost contemporaneously, both Jews and Christians were striving to fix their methods of marking time.[2] Because they had been scattered by Rome's persecution, and could no longer "observe" the moon, and flash their fire signals from mountain to mountain to proclaim the new month, the Jews felt compelled to compute a fixed calendar. The early councils of the Christian church, convened by the state, were likewise seeking the prerogative of regulating the calendar, which function had formerly been assumed by the ancient pontifex maximus of Rome. Mar-Samuel of Narhardea,[3] in the third century, pioneered a computed calendar for the Jews; and the Council of Nicea in 325 A.D. did the same for the Church. In the end, both the Jewish patriarch and the pope kept the charge, the one for Jewry, and the other for Christendom. But the ecclesiastical Council of Nicea dictated a change in the time of the Jewish passover, upon which the church wished to build her Easter feast,[4] and to which the scattered Hebrew people ultimately paid homage in the calculations of their almanac.

Factor 5. This change involved placing the earliest Jewish passover in March, instead of April, the limits of the cycle of the paschal new moons extending even from before the spring equinox, to April 5.[5] But Scaliger, master

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2 Sidersky, "Origin of Jewish Chronology," ch. II, par. 45.
3 Hoffmann, David, "Mar-Samuel," Leipsig, 1873.
4 Clavius, Christophor, "Romani Calendarii A Gregorio XIII P.M. Restituti Explicatio," ch. III.
5 Scaliger, Joseph, "De Emendatione Temporum," Francofurt, 1583, p. 108.

of chronology of the nations, computes that in the times of the Messiah, the earliest passover was April 8, and that the latest was May 6.[6]

Factor 6. Another most important feature of the change, one which apparently has not been noticed in connection with the problem of the crucifixion date, related to the command of the Nicean Council that the Passover--which, it should be particularly noted, both Christians and Jews were celebrating, even for a hundred years after the Apostles[7]--was to be placed on the first "Luna XIV" after the vernal equinox.[8] These words, "on" and "after" make all the difference in the world in the use of the dates of the Jewish passover moons for deciding the time of the death of Christ.

If we accept the testimony of Aristobulos, 200 years before Christ--that the passover of the Jews followed the sunset of the day when the full moon rising in the east faces the setting sun in the west--we can reasonably conclude that the Jewish passover, which is repeatedly described in the Bible as the 14th day of Nisan, was the day following the full moon date, and not on it. Herein seems to lie the crux of the many assertions which have been offered in regard to the time of the passion of Christ. Though the modern Hebrew calendar is faithful in a way, to the laws of astronomy governing the new moon and her phasis,[9] yet no longer does this Talmudic authority recognize the appointed moon of barley harvest for the passover. Since the destruction of the second temple, the Biblical sheaf of ripe barley corn has no longer been waved by the priest.

Factor 7. It has been contended by some astronomers, ans also by certain theologians, that one cannot say just how the Jews computed time when Jesus was here, and that their system of calculation was too irregular and too uncertain to be traced with certainty nineteen centuries after. Moreover, the influence of Nisan 15 in place of Nisan 14; for the Passover, in the Jewish calendar of today, is per-

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[6] Scaliger, op. cit., p. 265. Note: Scaliger, Joseph Justus, (1540-1609) was one of three great men who laid out the Gregorian reforms of the calendar in 1582, concerning whom George W. Robinson (Harvard) says: "Of his primacy beyond all rivalry, among the scholars of modern times, there can be no doubt." (Autobiography of Joseph Scaliger," Cambridge, 1927, preface, p. 7.)

[7] Scaliger, p. 105.

[8] Clavius, "Roman Calendar," ch. I, par. 3.

[9] Cf. Calendar in American Jewish Year Book.

haps as equally responsible as is the question of the placement of the full moon date itself, for this uncertainty on the part of many scholars, both Hebrew and Christian, in regard to the crucifixion date.

These early historical facts, and the Jewish calendar features mentioned, are closely connected with any solution of the passion date. Therefore, the attempt is here made to include some of these unsolved questions in the problem to be considered, especially as regards the paschal moon of Nisan. A chronological setting should not detract from the spiritual picture of the cross of Christ, if it shows it immovable in time and prophecy.

Many scholars are out of agreement as to the length of Christ's ministry and the number of passovers; but the events and scenes in the gospel record are so correlated that it seems entirely possible to relate the epochal years of His life to an outline which fits the chronology involved, both from a prophetic and historic viewpoint. As these inspired pictures of Christ are placed side by side, His whole life portrait is redrawn, as it were, and the scenes become harmonious and complete. Suddenly is revealed a depth of meaning between prophecy, history, and the science of time.

Factor 8. It is purposed here to show (1) that the method of reckoning time used by the Jews in the first century was scientific, and in harmony with known laws of the moon's behavior; (2) that, inasmuch as their system was the result of many centuries of observing the moon, in seeking from the Jewish mode of reckoning the facts concerning the luni-solar year, we are appealing to the original source of this kind of time, and consequently to one of primary authority.

B. Timekeeping in the First Century.

1. The Jerusalem Era. The year 170 of the Seleucid era (about 142 or 143 B.C.) marked the recognition of Jewish independence by Demetrius, of the house of Seleucus. Simon, the last of the Maccabean brothers, was then high priest in Jerusalem. In this same year, the people of Israel began to date their documents and public instruments according to the year of the high priest, as mentioned in the Apocrypha. Thus: "In the first year of Simon, the high priest, the governor and leader of the Jews."[1] This custom evidently continued on down to the time of Luke, who similarly dates the ministry of John the Baptist, with joint reference to emperor, governor, and high priest.[2]

The "Jerusalem Era" was thus established, and has been found engraved on the coins dated the fifth year of Simon's reign.[3] "Mathematicians therefore computed for them [the Jews] the cycles, and taught them how to find, by calculation, the conjunctions and the appearance of new moon."[4] Sidersky claims it is probable that "these calculations go back much further" in point of time.[5] He thinks highly of the happy comment of Scaliger, who several times refers to the method of Jewish reckoning as "the most ingenious and most elegant of all systems of chronology."[6]

Thus the Hebrew people came up to the time of Christ with a dated chronological system--a factor of importance in our quest. The Sanhedrin determined each

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1 1 Maccabees 13:42. (Wace edition, London, 1888, Vol. II.)
2 Luke 3: 1,2.
3 Reproduced by Benzinger, in "Hebrew Archaeologie," Leipzig, 1904, p. 196.
4 Albîrûnî, "Chronology of Ancient Nations" (trans. by Sachau), London, 1879, p. 68.
5 Sidersky, David, "Etude sur l'origine astronomique de la chronologie juive," in Memoires presentes par divers savants a l'Academie des Inscriptions et belles-lettres de l'Institute de France, Vol. XII, part 2. Paris, 1913, Introduction, p. 597.
6 Scaliger, Joseph, "De Emendatione Temporum," Francofurt, 1593, p. 108.

Jewish year by means of astronomical calculations. Although the formula used by the Secret Council for Intercalation has not been found, yet it was referred to by Moses Maimonides, who said that he possessed it.[7] Mar-Samuel of Nahardea also had it, and by it computed a Jewish calendar for 60 years to avoid the necessity of double festival days. This he sent to Rabbi Johanan in Jerusalem as proof of his knowledge.[8] It was Hillel II who, in the 4th century, passed the secret on to the outer world, and so it became the basis of the modern Jewish calendar.[9]

The Jews doubtless had known the length of the year from Egyptian times, but their method of intercalation was different on account of their Passover feast. This they regulated by the "maturity of the barley."[10] Moses commanded that they should not even reap their barley until the first fruits of it had been offered to the Lord at the time of the Passover. Sidersky adds, "The aim of the Mosaic command was to regulate the months according to the course of the moon, and the whole year in accordance with the course of the sun--by assigning as a starting point the lunar month coinciding with the beginning of a determined solar season."[11] That "determined solar season" was still the barley harvest in the time of Christ. Later on, as after the dispersion of the Jews, "The Sanhedrin did not content itself to observe the maturity of the barley, but added

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7 Maimonides, Moses, "Constitutiones de Sanctificatione Novilunii," published by Blaise Ugolin, Venise, 1755, quoted by Sidersky, p. 662. Note: Maimonides, or Moses Ben Maimon (1132-1204), is sometimes called the "second Moses." His essay on the Jewish calendar makes him important both to Jewish and Christian scholars.

8 Hoffman, David, "Mar-Samuel," Leipzig, 1873, p. 21. Note: Mar-Samuel said, "The heavenly courses are as well known to me as the streets of Nahardea." (Jewish Encyclopedia, art. "Mar-Samuel.")

9 Graetz, Heinrich, ("History of the Jews," Philadelphia, 1893, Vol. II, p. 573) says: "Hillel II. . . placed at everyone's disposal the means of establishing the rules which had guided the Sanhedrion up till then in the calculation of the calendar and the fixing of the festivals."

10 Lev. 23:14; Sidersky, "Chronology of the Jews," pp. 615,623. Note: Sidersky insists that the Jews also used the 19-year cycle from the time of their independence in 142-3 B.C., but that it was a result, not a cause, of the ritual ceremonies, which were the older. (p. 631.) In like manner, he considers the modern Jewish calendar to be founded on the primitive ceremonies of the luni-solar year. (op. cit., pp. 640,649.)

11 Sidersky, "Chronology of the Jews," p. 625.

to it the observation and calculation of the equinox."[12]

The ceremony of the barley harvest was the divine rule by which the position of the month Nisan was located. If by the first of Nisan, the barley was not sufficiently advanced for the passover festival, then a leap-month was added, and the feast period of the year was delayed until the following month.[13] The Lord had promised Israel, when He ordained the Passover, that He would send rain in due season in order that the corn should be reaped in time for the feast.[14] On account of this ceremony, a special field of barley for the temple was sown in the sheltered Ashes-Valley across the Kidron.[15]

Such a provision as the barley-harvest control of the year thrusts definite certainty into Jewish reckoning in the time of Christ--one which held until the Jews were scattered after the destruction of Jerusalem.[16] By this rule, we know that the Nisan paschal moon could not come until the rains were over and the barley ripe.[17] On these two counts, a passover in Dystrius, the ancient name for March, is out--for all the reports on agriculture and meteorology in Palestine, ancient and modern, show that March is the month for the latter rain, and that barley ripens in April.[18] The Hebrew paschal song included this refrain: "The rain is over and gone."[19] Consequently, as regards the astronomical element

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12 Op. cit., p. 623.

13 The Karaites were accustomed to make the test also in Shebat, 50 days before the passover. (Albîrûnî, "Chronology," p. 69.)

14 Deut. 11:14. (The early rain came in December; the latter rain in March.)

15 Edersheim, Alfred, "Life and Times of Jesus the Messiah," New York, 1896, Vol. II, p. 619.

16 Sidersky says: "It was no more possible under Constance to apply the old calendar." ("Chronology," p. 651.)

17 Compare Part V, Sec. E. Note: The modern Jewish calendar is based upon an equinoctial moon which came in March, in direct opposition to the barley-harvest moon of the first century, which came in April.

18 See Part V, Sec. B. Note: The Nestorians in Persia keep count of the ancient Jewish Passover which is always placed on Nisan 14, or Luna 14, in April. "April is the month of barley-harvest and March is the month of rain." (Lamsa, G.M., Nestorian authority.)

19 Song of Solomon 2:10-13; "Patriarchs and Prophets," pp. 537, 538.

that enters into the date of the crucifixion, one should look in the ephemeris for passover moons in April, and not in March! Scaliger says that in the time of Christ the paschal moon limits were April 8 to May 6. He showed that those who later used the Dionysian moon tables thought that they were celebrating the Jewish Passover in Nisan when it was ten times in Adar during the cycle of nineteen years. He learned this, he said, from the Jews themselves.[20]

Another feature pertaining to Jewish reckoning in the first century concerns the day itself upon which the New Year was started. The Jews, Arabs, Chaldeans, and Damacenes all had the same custom in reference to the beginning of their months--they started the new month with the first appearance of the new moon after conjunction. The presence of the moon in the western sky at sunset was called the phasis,[21] and marked the following day as the first of the new month. This period from conjunction to phasis, Hevelius called the interlunary period,[22] while Scaliger called it the translation of the moon.[23] In this discussion in Part V, the term "translation" is used in the sense that it refers to the time between conjunction and the sunset marking the beginning of a new month--the sunset near to which the phasis always occurs.[24]

The Jewish new moons (that is, the new moons that marked the first day of the month), commonly exceeded the ordinary "size of the phasis," or first appearance of the moon.[25] While the Greeks started their month from the conjunction itself, it was a certain "shape of the moon" that regulated the beginning

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20 Scaliger, "De Emendatione Temporum," p. 107.

21 The plural of phasis is "phases," which is pronounced with a soft "s". On the contrary, the plural of the ordinary word "phase" is likewise spelled "phases," but is pronounced pha-zes. The context must identify the words as used in this discussion.

22 Hevelius, Johannes, "Selenographia, sive Lunae Descriptio," Gedani, 1647, p. 274.

23 Scaliger, "De Emendatione Temporum," p. 85.

24 It was not the actual minute at which the phasis of the new moon was observed which marked the new days, but the sunset near which it took place. Scaliger says repeatedly that the Jews started their month "from the phasis of the moon," (ἀpὸ phaseōs selēnēs), but always places the phasis at sunset--ab accaso Sole.("De Emendatione Temporum," p. 85.)

25 Scaliger, op. cit., p. 6.)

of the Jewish month. Scaliger sometimes called it the "horned moon."[26] Rabban Gamaliel, chief of the Sanhedrin in the middle of the first century, had pictures of the moon on a tablet on the wall of his upper chamber. By means of this chart, he examined the witnesses who had observed the moon, and would ask, "Didst thou see it [the moon] on this wise or that?"[27]

In Jerusalem was a large courtyard where the witnesses were examined by the Beth-Din. They were questioned: "Say, in what position did you see the moon, in front of the sun (i.e. to the east of it), or behind it? To the north of it, or the south? What was its elevation on the horizon? To which side was its inclination? What was the width of the desk?"[28] The accompanying illustration makes a little plainer the meaning of the questions asked, which after all were truly scientific.

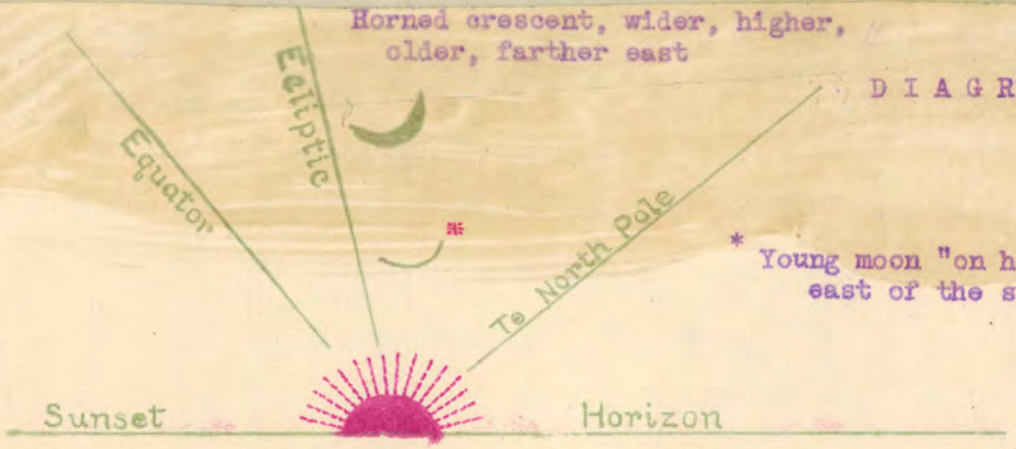

DIAGRAM A

"In the spring, because of the steep ecliptic the crescent moon is level with the horizon. With very young moons it looks like a very fine bright thread from left to right.. . It often happened to me that in the spring, when I was looking for the young new moon, which is as fine as a thread, I would believe for a moment that such a colored horizon stripe was the crescent, and have exclaimed: 'I have it,' only to see a minute later, that I had been mistaken, because the thread disappeared or divided itself."--Albert Schoch, in a letter to P.J. Schaumberger, quoted in Biblica, November, 1927.

26 Idem, p. 77. Note: Hevelius fully describes the "horned moon," and designates when the moon appears as such. ("Selenographia," pp. 281, 282.) This will be further demonstrated in Part V, Sec. E.

27 Jerusalem Talmud, Section Moed, Vol. VII, Rosh Hashana 2:3.

28 "Jerusalem Talmud, "Section Moed, Vol. VII, Rosh Hashshana 2:8; Sidersky says: "The calculation of which [the conjunction] was known in the course of the last centuries preceding the Christian era. . . by calculating this visibility in advance by means of inductive methods established by the ancients in consequence of observations over centuries."(Appendix B, p. 661.)

The very nature of these questions shows the extent of the astronomical knowledge which the Sanhedrin possessed concerning the moon's phasis. The historical testimony is obviously true that this tribunal had in hand the calculations pertaining to the moon's position and her translation at the time of the new moon.

These observations were continued even long after the knowledge of astronomy made it possible to calculate the date of the new moon in advance[29]--at least a century before the time of Christ. The deliberations of the Sanhedrin always took place behind closed doors, thus surrounding with mystery their secret council, called the "Sod-haïbour."[30]

The questions asked the Hebrew "observers" in the first century A.D. involve the same principles as used today in computing the common almanac. "How wide was she?" inquired Rabban Gamaliel. So it is that the width of the moon from horn to horn determines her position in relation to the earth. The relatively widest moon is nearest the earth, that is, in perigee; the least wide moon is farthest off, or in apogee.[31] The witnesses reported how near the sun was to the moon, and how low on the horizon. The altitude of the moon above the horizon, and her distance from the sun at sunset indicate in a general way the moon's age; namely, how many hours have elapsed since conjunction. The older she is, the later she sets after the sun.

The proclamation of the new moons by the Sanhedrin constituted one of the strongest elements of cohesion among the Jews, and was jealously guarded as a

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29 Hoffman, "Mar-Samuel," p. 20; Sidersky, "Chronology," p. 661. Note: Full details of this court in Jerusalem and the ceremony of signaling the announcements of the new moons, are given in the Mishna (Rosch Hashshana, I and II.)

30 Zuckermann, B., "Materialien zur Entwick, der altjüd. Zeitrechnung im Talmud" (Material for the Development of the Ancient Jewish Time Calculations in the Talmud), Breslau, 1882, p. 21.

31 Note: By comparing the various dates of the moon in the American Ephemeris (1939, p. 146,) for apogee or perigee, with the dates of her various diameters (pp. 147-162), it will be noticed that on whatever date she is in perigee, her diameter is greatest, and when in apogee, she is the least in width.

special prerogative of Palestine.[32] Rabban Gamaliel said that he knew the value of the synodic month from his grandfather, Hillel the Babylonian,[33] and in the "Meghilath Taanith" we have the first complete enumeration of the Jewish months in their order,[34] which, according to Schwab, "must have been written and introduced about 6 or 7 A.D."[35] The Palestinian Jews of the first century kept their calculations based on the true conjunction and phasis, in contrast to which the Jews of Babylon, and those under Babylonian influence in the time of Hillel II (359 A.D.), computed their calendar on the Moled, or mean conjunction.[36] There may be, however, as much as 14 hours difference between these two conjunctions.[37]

The significance of this fact must not be overlooked as a most important feature of Jewish time in the first century; for in the study of the dates pertaining to the years of Christ's ministry, we are dealing entirely with the true astronomical moon as employed by the Palestinian Jews, and not with the fictitious moon of any cycle as is the basis of the Catholic Church Collect, and of the modern calendar of the Jews.

After 1500 years of experience, the Jewish Sanhedrin were well versed in the the science of reckoning time. The famous treatise of Maimonides, philosopher and Hebrew sage of the thirteenth century, is perhaps our best example of the ancient Jewish astronomy, which became his later heritage. He claimed that his formulas of computation of the moon's phasis had long been known to the Jews, and that they used these calculations as a check on the testimony of the witnesses.[38] "An identical method is still used by the Karaite scholars for making up their

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32 Graetz, "History of the Jews," Vol. III, pp. 117, 118.
33 Talmud, Rosh-Hashshana, 25a, quoted by Sidersky, p. 656.
34 "Rouleau des Juives," quoted in Sidersky, p. 619.
35 Schwab, M., XI Congres des Orientalistes, 1897.
36 Hoffman, "Mar-Samuel." "It was the modern computation with the elements of calculation established by the Babylonians and accepted by the Palestinians, which Hillel II, by virtue of his power as chief of the Sanhedrin of Palestine, officially passed on to universal Judaism thus assuring their universal unity until our day." (p. 20)
37 Sidersky, "Chronology," p. 659.
38 Sidersky, "Chronology," p. 626.

calendar, as described by Kokisoff."[39]

Thus the translation of the moon--or calculation which determined the first day of each new month--is perhaps the most complex feature of the three involved in connection with Jewish timekeeping in the first century, which are: (1) a dated era; (2) a festival ritual governing the position of the paschal month; and (3) the translation of the moon marking the first day of each month.

From the days of Ezra and Nehemiah to the present time, a long series of historical and astronomical source materials now offer a complete picture of the new moon and her phasis. Every detail of her performance is described either on tablets, stone, or parchment, or in books of ancient and modern astronomy. Thus has the way been prepared for effective chronological study with reference to Jewish luni-solar time, and its bearing upon the death-year of Christ.[40]

Any reasoning that Jewish time in the first century was based on a plan so irregular and secret that it is now impossible to lay bare the system is not at all in harmony with the facts. The historical records, and the customs and ceremonies connected with the Jewish form of year are fully recognized and understood by both Hebrew and Christian scholars, and may not be ignored. To the Jews

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[39] Sidersky, op cit., p. 673.

[40] The leading sources and authorities supporting the basic principles of this argument in reference to the moon are: (1) The "Venus Tablets of Ammizaduga"--on which Kugler worked so long, and on which he based his "Babylonische Mondrechnung"--is perhaps our earliest reference; (2) Geminus, who worked out his mathematical astronomy on the moon's motions in the century before Christ; (3) The House of Hillel, which presided over the regulation of the year for the Jews in the time of Christ; (4) after the destruction of Jerusalem, Mar-Samuel (c. 170), who was called "Yarchinaah," because he knew so much about the moon; (5) then Hillel II (359), who applied the Jewish secret of time to a fixed calendric system; (6) the Karaites, who arose in the 8th and 9th centuries as defenders of the Mosaic ceremonies pertaining to lunar-solar time; (7) Albîrûnî (1000), who presented the first complete record of the Jewish calendar; (8) Maimonides (1178), who produced his famous essay on the translation of the moon and her phasis; (9) Abraham Hanassi (1120), who was another Hebrew computer of note; (10) Scaliger (1582), who has been called "victor over time," and who numbered all days by the Julian-day numbers; (11) Hevelius (1648), Polish astronomer, who left a complete record of all the various kinds of lunar translations and their causes; (12) Fotheringham, Schoch, and Neugebauer, who were pioneers in modern research on the moon's phasis; (13) Sidersky, Zuckermann, Kokisoff, able computers in Jewish time; and (14) the Oppolzer, Schram, and Brown tables, together with the Standard Ephemerides, which constitute invaluable aids to astronomical research in the 20th century.

had been committed, through the prophet Daniel, a long series of time prophecies relating to the principal nations of earth, recognized by both oriental and modern chronology as important, and definitely dependent for orientation upon a stable system of common time. This has been provided for us in the blending of Jewish and Roman timekeeping.

Both Julius Caesar and Augustus did their part in regulating the civil calendar of Rome,[41] while the Jerusalem era proved to be a stable epoch in time-keeping. Each day of those years has a definite number in the universally-accepted Julian-day numbering.

2. Julian Calendar. In modern times, civilization largely follows the Gregorian calendar, which originated in 1582 A.D. From the first century on to the days of Gregory XIII, in 1582, dates are commonly recorded in Julian time.[42] Every day in each week of this long period of time has its designated number in Scaliger's Julian-day reckoning.[43] This system offers a simple but absolute method for determining the feria, or day of the week, for any given date in the time of Christ. Scaliger carried his numbers back to a point many centuries before Christ, his zero number ending on a Monday.[44] Every Julian-day number, therefore, represents a certain number of weeks with a remainder. These remainders correspond to the days of the week according to Schram's table:

Remainders	0	1	2	3	4	5	6
Feriae -	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.

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41 "Encyclopedia Britannica," art. "Calendar."

42 In the American Ephemeris (1939 ed., pp. 808-811), appears the standard formula and tables for converting Gregorian dates into Julian time.

43 This table is found in any late American Ephemeris. The Julian-day tables have been called the "Astronomer's Bible," so universally have they been adopted in astronomical circles.

44 See Schram, Robert, "Kalendariographische und Chronologische Tafeln," Leipzig, 1908.

In other words, since the Julian-day numbers ended with Monday, any remainder of a number, after the weeks are taken out, will represent just so many days this side of that first Monday. If there is no remainder, then the number itself represents Monday. For example, to find the day of the week for April 27, 31 A.D.: Its Julian-day number is 1732497.[45] Taking out the weeks--by dividing by 7--we have four days left. Add these four days to Monday, and we get Friday.

If one does not have access to the American Ephemeris, a simple table may be made for first century dates as follows: January 1 (1 A.D.), Julian time, was Saturday.[46] By reckoning forward from this point to the year 31 A.D.--observing the leap-years--January 1 will be found to be Monday for that year. From Monday (inclusive) add the 117 days reaching to April 27, and we similarly get Friday.

Every day has been astronomically numbered as far back as history goes. No feria, or day of the weekly cycle, has ever been added or dropped. The first century was not only true to the days of the week, but the Julian calendar was

Insert, Part V, p. 15, as footnote.

[47] At this time, the Hebrews had been calculating the conjunctions and phases for at least a century (Albiruni says "nearly 200 years after Alexander,"--op. cit., p. 68), and perhaps longer. (Sidersky, "Chronology of the Jews," p. 615). They had divided the hour into 1080 scruples, a value which was very old, which had originated with the ancient sexigesimal (or fractional) system of the Chaldeans about 400 B.C., and which agreed with the "Almageste" of Ptolemy (Sidersky, op. cit., p. 639). With the important feature of the moon's fast and slow motion, the Beth-Din must have been indeed familiar, for all the questions asked the Hebrew witnesses, though directly referring to the moon's position in the sky, thereby had specific relation to her rate of motion. In the century before Christ, Geminus wrote in the "Isagogue," "the sixtieth part of a degree is called a minute; the sixtieth part of a minute is called a second. Likewise the second is divided into sixty parts, and each sixtieth part is called a tertie." [Italics mine.] ("Elementa Astronomiae," p. 205) He further showed that with this table in hand, the Chaldeans had recorded the angular distance the moon travels in compassing the zodiac belt; that they had actually observed that in 19756 days she had gone around the zodiac 723 times and 32 degrees over. (Op. cit., pp. 203,205) And so the least and maximum daily movement of the moon had become known facts before Jesus was born. They had been computed by the scientists of Babylon, the "home of astronomy." (Hoffman, "Mar-Samuel," p. 17.) It is said that the Jews learned from the Babylonians much of the science of astronomy in which they had "multiple knowledge." Also, "among them the study of this science was declared a religious duty." (Op. cit.)

In other words, since the Julian-day numbers ended with Monday, any remainder of a number, after the weeks are taken out, will represent just so many days this side of that first Monday. If there is no remainder, then the number itself represents Monday. For example, to find the day of the week for April 27, 31 A.D.: Its Julian-day number is 1732497.[45] Taking out the weeks--by dividing by 7--we have four days left. Add these four days to Monday, and we get Friday.

If one does not have access to the American Ephemeris, a simple table may be made for first century dates as follows: January 1 (1 A.D.), Julian time, was Saturday.[46] By reckoning forward from this point to the year 31 A.D.--observing the leap-years--January 1 will be found to be Monday for that year. From Monday (inclusive) add the 117 days reaching to April 27, and we similarly get Friday.

Every day has been astronomically numbered as far back as history goes. No feria, or day of the weekly cycle, has ever been added or dropped. The first century was not only true to the days of the week, but the Julian calendar was of such a nature that the seasons came at the proper time of year in contrast to the Egyptian calendar, whose feast days wandered through all the seasons, because its year was too short.

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[45] American Ephemeris, p. 808.
[46] Encyclopedia Britannica, art., "Calendar."

3. Accuracy of Barley-Harvest Intercalation. From the time of the Nicaean decree until the present day, it has been passed on from generation to generation that the Jewish Passover "was at the first full moon after the equinox of spring."[20] The tables of the modern Jewish calendar follow this plan. Many historians, both ancient and modern, have taken it for granted that the Jews had always kept their Passover at this time, and that such was therefore the case in the days of Christ. The Karaites, who according to Chwolson closely adhered to the Sadducean literature, and represent a pre-rabbinical view of the Mosaic law,[21] apparently have been the chief opponents to this ruling. Their prolonged polemic with the Rabbanites in the eighth and ninth centuries,[22] is an evidence that such regulation of the Jewish Passover was not the original precept of Moses. This far-reaching influence of the Karaite teaching made itself felt upon the Adventists in 1844.[23]

Since the original Mosaic law--not the Mishnaic or Talmudic reflection of it[24]--involved a barley-harvest paschal moon instead of an equinoctial moon, the question naturally arises as to when this change was made, and how it came about. In the Jewish period following the destruction of Jerusalem, the Sanhedrin at Jamnia "became the heart of the Jewish nation."[25] The Jewish calendar had not yet been "permanently fixed," and had to be regulated from time to time. The festivals were dependent "upon the course of the moon, and upon the influence of the sun on the harvests." Every two or three years the solar year exceeded the lunar by about a month, and a month was inserted, making a leap year of thirteen months. This "intercalary month was announced by the Patriarch in a circular letter to the community." About fifty days before the Passover, witnesses examined the state of

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20 Lindsay, Jas. B., "Chrono-Astrolabe," Dundee, 1858, p. 119; Sidersky, "Chronology of the Jews," p. 626. Note: Scaliger (p. 106) makes this enlightening statement: "Some were using the pure Jewish year, and others were fixing their cycle at the vernal equinox."

21 Chwolson, Daniel, "Das letzte Passamahl Christi," Leipzig, 1908, pp. 31,176, Note 2.

22 Poznanski, Samuel, "Ben Meir and Origin of Jewish Calendar," Jewish Quarterly Review, Vol. X, pp. 152-160. Note: Sidersky mentions the Sadducees, Essenes, and Bethusae in the 2nd century B.C., as fighting the calendar. (p. 623.

23 See Part II, Secs. VI and IX.

24 Chwolson, op. cit., p. 17.

25 Graetz, "History of the Jews," Philadelphia, 1893, Vol. II, ch. XIV.

the barley to determine if it would be ripe in time for the feast.[26] Since the days of Moses, the maturity of the barley had been a determining factor in regulating the Jewish year.[27]

Up until the Council of Nicaea, the Christian Easter, especially in the East, had been celebrated for the most part at the time of the Jewish Passover, and "indeed upon the days calculated and fixed by the Sanhedrin in Judaea for its celebration."[28] On the contrary, in Europe, "some earlier, some later, were intercalatin the months . . . the Europeans were placing their cycle at the equinox, and were celebrating the Passover on the next full moon after the equinox."[29] These contentions had agitated the church since the time of the Roman bishop Victor, who had persecuted the churches of Asia for following the "14th-day heresy," as they called it, in reference to the Passover.[30] But at the Council of Nicaea, "the last thread was snapped which connected Christianity with its parent stock."[31] The future Easter observance was to be rendered independent of Jewish calculation according to these words, which have been attributed to Constantine:

> "Henceforward let us have nothing in common with this odious people; our Saviour has shown us another path. It would indeed be absurd if the Jews were able to boast that we are not in a position to celebrate the Passover without the aid of their rules."[32]

In the subsequent years, the Jews went through "iron and fire."[33] The Christian emperors forbade the Jewish computation of the calendar, and did not allow the announcement of the feast days. Graetz says, "The Jewish communities were left in utter doubt concerning the most important religious decisions" as pertaining to their festivals.[34] The immediate consequence was the fixation and calculation

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26 Albîrûnî, "Chronology of the Ancient Nations," p. 69.
27 Lev. 23:10.
28 Graetz, Vol. II, p. 563.
29 Scaliger, op. cit., p. 106.
30 Op. cit.; see also Eusebius, "Ecclesiastical History," bk. V., ch. 24.
31 Op. cit.; Graetz, Vol. II, p. 563.
32 Graetz, Vol. II, p. 564. See also Eusebius' "Life of Constantine," bk. III, ch. XVIII.
33 Sidersky, "Chronology of the Jews," p. 640.
34 Graetz, Vol. II, p. 571.

of the Hebrew calendar by Hillel II, who (359 A.D.) placed above the dignity of the Patriarchate, the unity and cohesion of the scattered Jewish communities, to whom he made known the secret of Jewish reckoning. According to Graetz, the Jewish system conformed to a cycle of nineteen years, in which seven leap years occur, although he adds that it "has not been ascertained how much of this system was invented by Hillel."[35]

The decrees of Nicaea, "destroyed the Temple of the Law in Judea," as it were, and the ancient regulation of Moses for harmonizing the course of the moon with that of the sun was ultimately replaced by calculations involving the vernal equinox,[36] after which the nearest full moon was chosen to be the paschal moon. From this equinoctial point, the church built up her ecclesiastical calendar and its Easter feast. It is easy to gloss over the real significance of the Council of Nicaea and its bearing upon the Jewish system of time, for though the church desired to depart from Jewish calculation, and to adopt a movable feast,[37] yet in the end, it turned out that both the Jewish and Roman Catholic festivals came to be computed from the same point of time--the time when the sun crosses the equator, the first point of Aries, or the vernal equinox. Although it is clear that the responsibility for this change rests with the bishops of Nicaea, yet, according to Clavius, the church merely enjoined that which had been sanctified by the ancient Roman Pontiffs:

"The Catholic Church has never used that [Jewish] rite of celebrating the Passover, but always in its celebration has observed the motion of the moon and sun, and it was thus sanctified by the most ancient and most holy Pontiffs of Rome, but also confirmed by the first Council of Nicaea."[38]

Clavius, quoting from Socrates and Theodoret, cites the letter that was sent from the Nicaean Council to the church of Alexandria, and to the brethren in Egypt, Libya, and Pentapolis:

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35 Op. cit., p. 574.
36 Sidersky, "Chronology of the Jews," p. 624.
37 Clavius, op. cit., p. 54.
38 Op. cit., p. 54.

"But because it concerns the opinion of all over the celebration of this most sacred feast of the passover, because, wisely, the controversy over this thing has been intelligently undertaken at your requests, and has been conveniently settled, in order that all the brethren who dwell in the east, and who were previously accustomed to immitate the custom of the Jews in the observation of the feast, and all of you who hold from early times to that same custom as we in that celebration, may thus now at length carefully follow us Romans with united minds in the same celebration."[39]

Consequently, it should be recognized and made perfectly plain that the plan of the church and of the modern Jewish calendar as well, to regulate the passover with reference to the position of the sun at the spring equinox, and of the full moon next after, has to be referred back, according to Clavius, to the "most ancient and most holy Roman Pontiffs," and has no connection at all with the original Mosaic command. The Council of Nicaea confirmed what was evidently the prevailing custom among the churches, when it added that "the fourteenth of Luna of the first month must be sought through the cycle of the golden number nineteen."[40] This command shows that the church calendar henceforth was to be based on the nineteen-year cycle. Eventually the Jews followed the same regulation.

But though the Nicaean Council had set the passover back toward the first point of the spring equinox, yet the church soon recognized that Aries, the zodiac sign of the vernal equinox, did not extend as far as the primitive "first month" mentioned in Moses' command. She therefore added five days to the end of Aries, making her furthest paschal limit April 25. In reference to this Clavius, after quoting Theophilus, says:

"From this regulation it is plain that in that time [third century] the passover was wont to be celebrated from March 22 even to April 20, yet to which time there were afterward added five other days, because the first month of necessity required this, so that the passover could be celebrated even to April 25 inclusive. For the first month is not that one in which the sun runs through the whole of Aries, as the Fathers in the Caesarean Synod seem to have wished, but whose Luna 14 falls upon some one day from March 21 inclusive, upon which the equinox is, even to April 18 inclusive [the limits of Aries]. From which it follows that the paschal rite can be celebrated upon April 25, as we shall explain a little later."[41] [Italics mine.]

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39 Op. cit., p. 55; Socrates, "Historie Ecclesiasticae," lib. 1, cap. 6; atque Theodoretus, "Hist. Eccles.," lib. 1, cap. 9.

40 Clavius, op. cit., p. 56; Sidersky, "Chronology," p. 560. Note: The 19-year cycle was adopted by the church council of 284 A.D. Cf. Siderksy, op. cit., p. 650.

41 Op. cit., p. 55.

The foregoing reference definitely shows that the period of the equinoctial moon, corresponding to the sign Aries, did not coincide with the so-called "first month" of Moses' command.[42] But even though the church added five days to the equinoctial period in which her paschal moon must occur, even so, the limits of this period did not then coincide with the limits of the period in which the barley harvest moon had to full--the latter being shorter, and open to only one full moon--while in the place chosen by the church for her Easter feast sometimes two full moons could happen.

The period appointed for Easter has had also other pronounced irregularities. The equinoxes, due to precession, have wandered far from their positions known in the infancy of astronomical knowledge. The whole ecliptic, since creation, is said to have shifted backwards as much as the sun moves in 81 days.[43] After the first century of the Christian era, every leap day which the Julian Calendar unnecessarily introduced, as in the centurial years not divisible by four, resulted in moving backward the position of the vernal equinox by one day. The wandering vernal equinox, which in 325 A.D., the Nicaean Fathers thought to be forever fixed, made necessary the correction of the calendar in 1582. It happened "that the pasch was celebrated very often 7 or 28 or 35 days other than in the generation which the decrees of the Fathers enjoined.[44]

The differences between the "full-moon-of-barley-harvest" Mosaic rule, and the "first-full-moon-after-the-vernal-equinox" Nicaean regulation of the church are vital. Though both were featured by a period of time, which was to be marked by the first light of the full moon, yet the barley-harvest period did not always coincide with the equinoctial,[45] and both rulings were wide apart in character, purpose, and meaning. This will be seen by the following outline:

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[42] Ex. 12:2.

[43] Ferguson, "Astronomy," (London, 1811), says: "From the shifting of the equinoctial points, and with them all the signs of the ecliptic, it follows that those stars, which in the infancy of astronomy were in Aries, are now in Taurus, those in Taurus in Gemini, etc." (p. 189.)

[44] Calvius, op. cit., Caput II.

[45] The moons were different in embolismic, or leap years.

BARLEY HARVEST MOON	EQUINOCTIAL MOON
1. A command of Moses for Jewish Time.	1. A decree of Nicaea for the church calendar.
2. Only one moon.	2. Could be two moons.
3. A permanent and regular control of Jewish feasts.	3. A very irregular index to the time of Easter. the sign,
4. Coincided with "first month," or Nisan.	4. Coincided with Aries, and often with Adar.
5. A sure index to the crucifixion Passover.	5. Not the paschal moon which marked the death of Christ.

Of these two methods of determining a festival feast, the barley harvest has been commonly regarded as a period too elastic to represent an actual point of time. But be it noted, that the controlling conditions relating to the barley-harvest moon in the time of Christ were as exact, if not more so, than those which have thus far governed the vernal equinox in its control over Easter. The time of barley harvest in the Ashes-Valley field across the Kidron was remarkably accurate and permanent in its regulation of the passover festival. The latter rain extended into the first week in April,[46] and very quickly thereafter the barley would ripen. Into this defined and limited period one full moon only could occur.

Three conditions--(1) the ending of the latter rain, (2) the regular period of the ripened barley, and (3) the fulling of the one moon possible in that limited time after the first week in April--exactly determined the paschal feast and all the other festivals of the Jewish year. The results were dependable and specific. [illegible] the rule which Moses had commanded. It persisted to the generation in

Insert, Part V,p. 21, as footnote.

[48]The real meaning of Josephus' well-known statement about the passover, "when the Sun is in Aries" ("Works," p. 75), seemingly rests on a Pharisee interpretation of the paschal moon as the equinoctial moon of Aries--a definition in no sense in accordance with the Mosaic rule, nor in accordance with the Sadducean position which was dominant in the time of Christ's ministry. If Moses had appointed the passover to be in the ancient constellation of Aries, then another constellation, due to precession, would have marked the time of the feast in the first century A.D. (Ferguson, "Astronomy," p. 189.) On the other hand, if Josephus referred to the zodiacal sign Aries, as is probable, and not to the actual constellation itself, then on another count Moses can in no way be held responsible for the inference of Josephus, for it was not until seven or eight centuries after Moses' time that the "ecliptic was divided into twelve equal divisions, not associated with the actual stars," and the constellations were replaced by the signs. (Maunder, op. cit., p. 319.) These signs have never changed. The ecliptic is a circle of reference; and on it, from its first point of Aries, every celestial longitude is reckoned. (Young, Charles A., "General Astronomy," New York, 1898, pp. 11, 142.) Cf. Scaliger, op. cit., p. 169.

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2. Only one moon.	2. Could be two moons.
3. A permanent and regular control of Jewish feasts.	3. A very irregular index to the time of Easter.
4. Coincided with "first month," or Nisan.	4. Coincided with the sign, Aries, and often with Adar.
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[46] See Table II, p. 23, on rain record.
[47] Sidersky, "Chronology of the Jews," pp. 615, 624.

PART V, Sec. B, p. 22 a.

MOSAIC PASSOVER AND EASTER LIMITS

Only one full moon possible in the PASCHAL PERIOD

BARLEY EXAMINED--50 DAYS TO PASSOVER

LATTER RAIN

PASSOVER PERIOD

BARLEY HARVEST

1 week 28 days

FIRST MONTH

April 8 NISAN May 6 [2]

MOSAIC RULE

1 JEWISH MONTHS

2 JULIAN MONTHS

3 SIGNS OF ZODIAC

SHEBAT ADAR

MARCH APRIL MAY

PISCES ARIES 29[1] TAURUS

EASTER RULE

ALSO
(RABBINICAL RECKONING)

EASTER PERIOD

March 23
Vernal Equinox
in First Century

25 (April)

35 days

Two full moons possible in the EASTER PERIOD

[1] "The passover was wont to be celebrated from March 22 to April 20, even to which time were added five other days, the first month requiring this."--Clavius, "Romani Calendarii," p. 55.

[2] "In the times of the Messiah . . . the earliest passover was April 8 . . .the latest was May 6."--Scaliger, "De Emendatione," p. 265.

The Mosaic Passover Period involves a barley-harvest moon; the Easter Period, an equinoctial moon. In common years, the moons were the same; in leap years they were a month apart. If the time of the passover is wrong, the determinate date of the crucifixion is bound to be wrong--for a passover in March will occur upon a different day of the week from a passover in April of the same year. Consequently, all the March passover dates found in the tables of moons appearing in past and present discussion of the crucifixion date are thereby called in question--seeing that March passovers are not Mosaic, but Nicaean.

TABLE IX

C. Length of Christ's Public Ministry.

1. Daniel's 70th Week. When Jesus came into Galilee preaching, "The time is fulfilled,"[1] He referred to the "70th week" of Daniel 9.[2] According to Fraidl,[3] the Christian exegetes up to the Reformation, with but few exceptions, recognize a Messianic prediction in the prophecy.[4] Sir Isaac Newton was a later witness.[5] Ferguson's "Astronomy" was also one of many sources which early suggested to the Millerites the remarkable chronological relation of the "week prophecy" to the death of Christ.[6] Eusebius was perhaps the first to connect the half of this prophetic week with the public ministry of Christ.[7]

When the prophetic events in Daniel 9:23-27 are listed, they are found to include (1) the command that was to go forth to restore and to build Jerusalem (verse 25); (2) the anointing of the Messiah (verse 25); and (3) the cutting off of the Messiah (verse 26). This anointing and cutting off of the "Anointed One," outlined in prophecy give centuries before Jesus was born, finds its exact fulfillment in the beginning and ending of Christ's ministry. The Father and Holy Spirit bore witness to the anointing of Christ at His baptism,[8] and later, He himself preached openly that the event had been fulfilled.

Throughout the Christian era, there has been concerted agreement that in the prophecy of Daniel 9, the public ministry of Christ, ending in His death, is foretold. Fraidl insists that concerning no other prophetic text does so united an opinion exist.[9] The influence of this concept was in part transmitted to the

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1 Mark 1:15.
2 White, Ellen, "Desire of Ages," p. 233.
3 Fraidl, Franz, "Die Exegese der 70 Wochen Daniels," Graz, 1883, pp. 2, 28, and 154, et al.
4 In the foregoing citation, Fraidl tabulated practically all the commentaries on Daniel 9, both of Hebrew and Christian scholars, from the time just preceding the first advent to the Reformation. See pp. 156-159.
5 Newton, Isaac, "Observations upon the Prophecies of Daniel" (London, 1733), ch. 10
6 Ferguson, James, "Astronomy," Vol. 1, p. 192. (Old Edition quoted in Midnight Cry, April 20, 1843, pp. 19, 20.
7 Mommert, Carl, "Zur Chronologie des Lebens Jesu," Leipzig, 1909, pp. 92, 93.
8 Matt. 3:16, 17.
9 Fraidl, op. cit.

Millerites by Ferguson's "Astronomy," from which we quote:

"Now, as it is generally allowed, that by each of Daniel's prophetic weeks is meant seven years, the middle of the week must be in the fourth year."[10]

This is specific reasoning, for it indicates that in the history involved, as pertaining to Christ's ministry, between three and four years are to be accounted for. One of the important features therefore offered by the "70 weeks" prophecy is its index to the length of Christ's ministry. Fraidl's designation of Gabriel's words in Daniel 9 as the "week prophecy" is significant.[11] It is indeed the only prophecy in either Daniel or the Revelation, which presents its time period in terms of the week. But inasmuch as all other prophetic periods are interpreted on the year-day basis, the "seventy weeks" is of course cataloged according to this same vital principle. Each week of the seventy, as Newton and Ferguson allow, must be a week of years. It is the location of the last week which concerns the death-year of Christ.

From the time of Daniel's first appearance before Nebuchadnezzar down to the time of the ninth chapter, he had seen in prophetic vision the leading nations of the world, even to the end of time. But not until Daniel 9 does the Jewish nation, as such, enter the vision. Daniel had been waiting and praying for some sign or symbol of his own people. The answer finally comes, in which Gabriel tells him plainly and simply that the seventy weeks refer to his own people, the Jews. Consequently the seventieth, or last week of the prophecy, must also refer to the Jews.

The Jewish nation had been organized by a covenant with God,[12] and had been ordained by a system of sacrifices and oblations,[13] but Gabriel solemnly declares that in the midst of the seventieth week, the sacrifices and oblations would cease. He also implied that the Messiah would be cut off during that same "week."[14]

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10 Midnight Cry, April 20, 1843, p. 19.
11 Fraidl, op. cit., Introduction.
12 Ex. 24:8; Heb. 9:19,20.
13 Heb. 9:1.
14 Dan. 9:25,26. Note: Since the seven weeks and three score and two weeks were to reach to Messiah the Prince, who was to be cut off after the three score and two weeks, therefore the "cutting-off" must be in the last, or seventieth week.

These two startling events of the prophecy not only bring it to an end in the time of Christ, but the two events coincide, showing that Jesus was to die in the midst of the week, for it was to be His death that would cause the Jewish sacrifices to cease.[15]

There are no features of the passion week of Christ that enter with more difficulty into the redrawing of the picture than those last scenes connected with the paschal rite itself, especially as relating to the Jews and their leaders. The harmonizing of some of the parts that are hard to understand has been ably presented with new and fresh meaning by Chwolson, who sees in the time of Christ a division in Jewish circles, as between the Pharisees and Sadducees, concerning the slaying of the paschal lambs on Friday.[16] We know from the "week" prophecy that God's appointed end had come for the Jewish service, that its meaning was lost, perhaps its form somewhat changed.[17] Jesus had not kept the third Passover at Jerusalem,[18] and now at the fourth, He "was standing at the point of transition between two economies and their two great festivals,[19] and ordains a new feast for His church before He suffers. "He, the spotless lamb of God, was about to present Himself as a sin-offering, and He would thus bring to an end the system of types and ceremonies, which for four thousand years had pointed to His death."[20]

In the uncertainty that surrounds the slaying of the lambs of the last Passover--their number, and the time of the offering--many, with Paul, see on the cross in the "midst of the week" the true Lamb of God, and say, "Even Christ our Passover is slain for us."[21] This Scripture has been quoted again and again by

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15 Heb. 10:5-9.

16 Chwolson, pp. 87, 129, 147. "Not the Pharisees, but the Sadducees were in power in Christ's time." (p.87.) Note: For thirty years, Daniel Chwolson was professor of Hebrew and Biblical Archeology in St. Petersburg University. At eighty years of age, he was a profound student of the text (1892).

17 "Desire of Ages," p. 33.

18 He remained in Galilee. John 6.

19 "Desire of Ages," p. 652.

20 Op. cit.

21 1 Cor. 5:7, margin. Cf. Frey, Joseph, "Scripture Types," New York, 1841, p. 107.

recent writers on the date of the death of Christ to show that on that passion Friday, Nisan 14, Jesus the true Lamb, took the place of the typical lamb, which would appear to have been offered in the temple on the day before.[22]

2. Number of Passovers. The following outline makes plain how the passovers, during the public ministry of Christ, may be identified and numbered--four in all:[23]

First Passover. (John 2:13)

"And the Jews' passover was at hand."

Second Passover. (Luke 6:1)

"And it came to pass. . . that He went through the corn fields." Luke's "ears-of-corn Sabbath," or a spring barley harvest, witnesses to another harvest year, and therefore to another passover between Christ's return to Galilee to announce His mission,[24] as in Luke 4:14, and the death of John the Baptist in Luke 9 at the time of the third passover. The "feast of the Jews," spoken of in John 5:1, may be the passover of this second year of Christ's ministry.

Third Passover. (John 6:4)

"And the passover, a feast of the Jews, was nigh." This third passover was at the time of the feeding of the five thousand, which event is described by the three Synoptics, as well as by John. Hence, it should be noted, each reference to this scene in Galilee in the other gospels is a testimony that the third passover also is nigh, and this correlation harmonizes the chronology of certain events in all four narratives.

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22 Chwolson, op. cit., pp. 37-40.

23 A careful reading of the sequence of events in the "Desire of Ages," will lead the student to the same conclusion as in this outline. See also Armstrong, W. P., "International Standard Bible Encyclopedia," 1915, art., "Chronology of the New Testament." Vol. I, p. 646.

24 This was after the first passover, and after John had been cast into prison. The ears-of-corn Sabbath is mentioned by all three Synoptics. They uniformly place this event midway between the Baptist's imprisonment--which was after the first passover--and his death, which is always immediately connected with the feeding of the five thousand, a circumstance preceding the passover in John 6. This was without doubt the third. Since each passover represents a barley harvest, the one in Luke 6:1, given midway between two passovers, must therefore correspond to another passover, doubtless the second.

Fourth Passover. (John 13:1)

"Now before the feast of the passover." This fourth passover is recorded by all four evangelists.

The gospel narrative outlining four passovers therefore accords with the "seventy-weeks" prophecy of Daniel, that between three and four years were involved in the public ministry of Christ--or to be exact, three and one-half years. The accompanying Table illustrates this outline of the passovers.

D. Ancient Position of Jewish Passover.

1. The Mosaic Rules. In all the ancient references to the Passover, the "fourteenth day of the first month" is emphasized as the day on which the Passover was kept.[1] There were no double passover days in Old Testament times. If ceremonial defilement prevented an individual from observing the regular festival, then he was commanded to keep the service on the fourteenth day of the following month.[2] Thus is pointed out the importance of the day, which was numbered "according to the moon;" that is, the days of the month were the same as the days of the moon.[3] Indeed the Hebrew word "hodesh " for month, means "new" moon.

It was the actual new moon, not any fictitious new moon that regulated the great festivals, for it was an "observed moon."[4] On the other hand, the barley harvest, ripened by the sun, marked out the paschal month, for the first fruits of ripe barley must be waved in the temple on the 16th day of Nisan when Israel came into the land. In other words, the Jewish feast period began with the month of barley harvest; and its paschal moon, or moon of Nisan, was the appointed moon of barley harvest.

The agricultural calendars of Palestine show that April is the month for the ripening barley. "From the time of harvest or the middle of April to the middle of September, there is neither rain nor thunder."[5] The same story in agriculture is engraved on the Gezer calendar stone, whose fourth-named month has been translated "barley harvest."[6] In Palestine, March is the month of the latter rain, which lasts until the first week in April.[7] After this the barley corn ripens rapidly.

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1 2 Chron. 35:1.
2 Num. 9:11.
3 Josephus, Flavius, "Antiquities of the Jews" (Trans. by Whiston), Cincinnati, 1844, p. 75.
4 Maunder, E. Walter, "Bible Astronomy" (2nd Ed.), p. 297; Deut. 16:1.
5 Jahn, Johann, "Biblical Archeology" (Trans. by Upham), Andover, 1823, p. 22. See also Buhle, Johan, "Economical Calendar of Palestine," in "Calmet's Dictionary of the Bible," London, 1830, Vol. III, pp. 704, 705.
6 Lidzbarski, Mark, "Old Hebrew Calendar-Inscription from Gezer," in Quarterly Statement of Palestinian Exploration Fund, 1909, p. 29.
7 Quarterly Reports on Palestinian Exploration Fund, art., "Meteorology."

However, the Mosaic ceremony connected with the barley harvest, so vital in its control of the Jewish year, did not long survive the first century of the Christian era, because of the dispersion of the Jews. The period of persecution which followed the fall of the second temple ultimately brought about a fixed calendar for the Jews--one that was based upon an entirely different rule of intercalation than the ancient barley harvest regulation. About the 8th century A.D., the Karaites arose to oppose the influence of the Rabbanite fixed calendar,[8] and to restore the barley-harvest schedule as the important index to regulate the leap-year. This controversy over the Hebrew calendar raged for several centuries.[9] It really represented a rivalry between Palestine and Babylon for the prerogative of keeping time for the Jewish nation. Though the Karaites were Biblically correct, in the end the Babylonian Jews gained control of the calendar, and Karaism dwindled. Since 1780, the Karaites have been slowly compromising with the Rabbanites on this question, and today follow a fixed calendar.[10]

2. Fourth Century Changes. After the destruction of Jerusalem, the unity of the scattered Jews more than ever depended upon the festivals being observed on the same days.[11] But two vital changes overtook the ancient Hebrew Passover. First, as pertains to the day, the persecution of the Jews had made impossible the use of fire signals in Judea for announcing the new month. Therefore, in order to keep with certainty a feast day in common with the home land, two festival days--particularly for the Passover--became the custom among the scattered people. The Jews of Palestine, and those among the Greek churches, kept Passover on the 14th day of the moon, while the outlying groups of Jews kept on the safe side by both observing the Passover on the day appointed by the Scriptures, and on the day following, called "Second feast-day of the Diaspora."[12] In this manner the Passover came to be observed on both Nisan 14 and 15. In the end, the computed calendar of the Jews preferred

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8 Albîrûnî, "Chronology of Ancient Nations" (Trans. by Sachau), London, 1879, p.69.
9 Malter, "Saadia Gaon," Philadelphia, 1921, pp. 70-77.
10 Kokisoff, Jufuda, "Brief Information on the Karaite Calendar," in Polish Encyclopedia (Trans. from Russian by Erna Borm). Note: Kokisoff says, "Thus in the near future is to be expected a simplified calendar in the sense that out of three rules only one will be made, i. e., the first of the month will always be the first evening following the true new moon."
11 Sidersky, "Chronology of the Jews," p. 623.
12 Poznanski, in Hastings' Encyclopedia, art. "Jewish Calendar."

Nisan 15 for the feast, and it is a feature of the modern Jewish calendar of today.

This early controversy in Jewry formed the background of the bitter conflict over Easter, which began in the second century among the Christians.[13] The argument was still over the same question--the 14th or 15th of Nisan. At length, in the 4th century, the Council of Nicaea met this issue.[14] The Christian feast was placed on the first Sunday after the Jewish Passover, which was confirmed as "Luna 14" of the first month. This was appointed as the first full moon following the spring equinox, in place of the full moon of barley harvest, which on account of persecution had fallen into neglect.

Second, as pertains to the month, this decree of Nicaea was really the cause of the large series of March passovers which characterized the calendar of Dionysius in 532.[15] The Dionysian tables were the basis upon which the church built up her own ecclesiastical calendar. In the discussion that arose in 1582 over the Julian calendar, Scaliger said plainly that the so-called paschal moons of the Dionysian tables came largely in Adar instead of Nisan; that they were, in fact, principally March passovers.[16]

This change in the paschal month is vital in the relation of Jewish time to the Julian calendar in the first century, for it is the passover day which ties Jewish time to our common calendar.[17] It is to be particularly noted that if this passover day is in March, it will occur upon a different day of the week from a passover in April of the same year. Consequently, all the March passover dates in the first-century tables of moons given in the general discussion of the crucifixion date are thereby called in question. And it is therefore evident that if the passover month is wrong, the determinate date is bound to be wrong.

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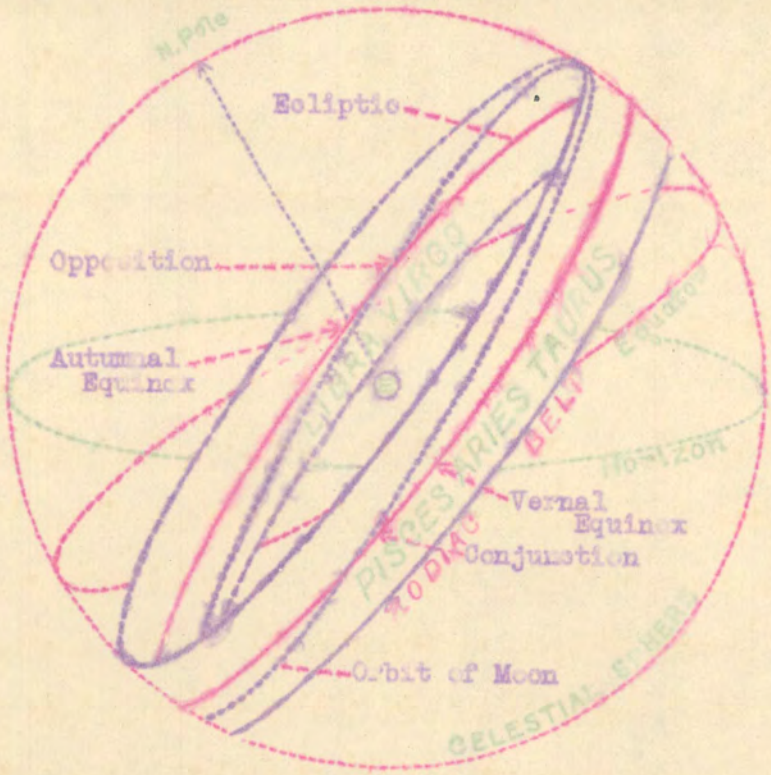
13 Hales, "Chronology," p. 67.

14 Clavius, "Romani Calendarii Restituti Explicatio," cap. ii, p. 63. Note: The exact words of Clavius are: ". . . Concilii Nicaeni, quae semel, atque iterum inculcant, Pascha celebrandum esse a Luna Xiiii. primi mensis exclusive" (. . of the Council of Nicaea, which once and again enforced that the Pasch must be celebrated by Luna 14 of the first month exclusively); Eusebius, Pamphilus, "Life of Constantine," Bk. III, Ch. 17.

15 Scaliger, "De Emendatione Temporum," p. 107.

16 Op. cit., pp. 106, 107, and Prologue.

17 Part V, Sec. E, Postulate I. (Table V)



MOON'S APPARENT MONTHLY COURSE IN ZODIAC BELT

Through the center of the ZODIAC BELT runs the ECLIPTIC, or sun's apparent path in the sky, as seen from the earth. The moon's apparent path is also projected by the eye upon the zodiac, around which she appears to travel every month. Though millions of miles apart, the paths of both sun and moon seem to be traced upon the same celestial belt. In one month's time the sun has advanced one sign only, while the moon has accomplished nearly the whole zodiac. Her orbit is inclined to the ecliptic with an angle of about 5 degrees, and upon this small inclination all her phases depend.[1] She passes through the zodiac in an irregular velocity, causing her to move north and south of the sun each month. Her smallest daily movement amounts to $11^{\circ}\ 6^{m}\ 35^{s}$, and her largest, $15^{\circ}\ 14^{m}\ 35^{s}$.[2] The sun requires 6 months to go from Aries to Libra, that is, from the Vernal Equinox to the Autumnal. The moon apparently travels this distance in about 2 weeks, as from new moon to full moon. In her daily revolution the earth turns from Aries to Libra in 12 hours.

1 Young, "Astronomy," p. 155.
2 Geminus, "Elementa Astronomiae," p. 211.

E. Translation of New Moon for Nisan.

1. The Moon's Motion. In order to understand any astronomical argument which may pertain to the crucifixion date, it is necessary to review the relation of the moon to the sun and earth.[1] The path of the sun in the heavens is a great circle called the ecliptic. A belt 8° wide on each side of the ecliptic is known as the zodiac. This particular width was chosen by the ancients because the paths of the moon and all the principal planets keep within this belt, and it is therefore a very convenient circle of reference. And in reference to this, the longitude and latitude of a star is reckoned in degrees, minutes, and seconds.

About 800 years before Christ, the zodiac was divided into 12 parts called signs, at which time the signs were separated from the primitive constellations of the same name. Each sign is 30° in length. The signs kept the same names as the original constellations, all being named after some animal, with the exception of Libra. The ones frequently referred to in this discussion are Pisces, Aries, and Taurus in the spring, and Virgo, Libra, and Scorpio in the autumn.

Another great circle in the heavens is the celestial equator, which is an imaginary projection on the sky of the equator of the earth. At two points 180° apart--known as the equinoxes--the path of the sun crosses the celestial equator. At those times day and night are equal. When the earth is nearest the sun, as at perihelion (about December 31), her orbital motion is most rapid; and at aphelion, the opposite point of the ecliptic (about June 30), her motion is slowest. Any motion of the earth of course influences the moon's motion.

The moon travels around the earth every 29 1/2 days, and in that same time passes up and down in its path through the zodiac belt. Sometimes she is north of the sun, sometimes south. Her rate of travel through the zodiac is irregular, sometimes fast, sometimes slow, because of her distance from the sun and earth. When the moon is between the sun and earth, this position is called "conjunction," and the moon is new. At this time the moon cannot usually be seen for a period of

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[1] The astronomical facts appearing here are found in any standard text on astronomy.

from 1 to about 4 days.[2] When the earth is between the sun and moon, this relation is called "opposition," and the moon is full.

All of these facts and figures have a direct bearing upon the time it takes the moon to come into sight after conjunction, and they therefore take on a definite relation to the moon's changing rate of motion. From new moon to full moon, i.e. from conjunction to opposition, the moon travels through the first half of her monthly circuit around the earth. This first half of the moon's circuit was of great importance to the Jews, because of (1) their "new moon" feasts which were gauged by the conjunction and its attendant phasis; (2) the passover sacrifice right after the opposition or full moon of Nisan; and (3) the three special days in the fall--(the New Moon Day of Tisri or Rosh Hashanah, the Day of Atonement, and the Feast of Tabernacles--which were connected with the new and full moon of Tisri. The true time of the moon in this period from conjunction to opposition runs in a cycle of 14 moons as follows:[3]

TABLE IV MOON'S CHANGING RATE OF MOTION
(In a 14 Moon Cycle)

Years in Cycle	Calendar Year	(1) New Moon		(2) Full Moon		(3) Period from New to Full Moon		(4) Period from Conjunction to Phasis[4]	
						d h m		d h m	
1.	1930	Apr. 28	19h 8m	to May 12	17h 29m	--13 22 21	--	1 0 8	
2.		May 28	5 36	June 11	6 11	--14 0 35	--	1 14 24	
3.		June 26	13 46	July 10	20 1	--14 6 15	--	2 6 32	
4.		July 25	20 41	Aug. 9	10 57	--14 14 16	--	1 23 14	
5.		Aug. 24	3 36	Sept. 8	2 47	--14 23 11	--	2 15 29	
6.		Sept. 22	11 41	Oct. 7	18 55	--15 7 14	--	3 6 13	
7.		Oct. 21	21 47	Nov. 6	10 28	--15 12 41	--	2 19 4	
8.		Nov. 20	10 21	Dec. 6	0 39	--15 14 18	--	3 5 43	
9.		Dec. 20	1 23	Jan. 4	13 14	--15 11 51	--	2 14 32	
10.	1931	Jan. 18	18 35	Feb. 3	0 25	--15 5 50	--	2 21 55	
11.		Feb. 17	13 10	Mar. 4	10 36	--14 21 26	--	2 4 12	
12.		Mar. 19	7 50	Apr. 2	20 5	--14 12 15	--	2 10 23	
13.		Apr. 18	0 59	May 2	5 14	--14 4 15	--	1 18 1	
14.		May 17	15 27	May 31	14 33	--13 23 6	--	1 4 17	

[2] Hevelius, "Selenographia," p. 273; Note: Very seldom, according to Hevelius, does the phasis occur on the same day as conjunction. This research found two times in which phasis and conjunction coincided on the same day: Oct. 13, 1844 (Boston); Sept. 19, 1933 (Greenwich).

[3] The moon phases were taken from "American Ephemeris," 1930-31.

[4] The full moon cycle was computed by subtracting each new moon date from the next full moon date.

In a cycle of 14 lunar months, in Table IV, the period of time in days, hours, and minutes in column 3--"Period from New to Full Moon"--represents the actual time it takes the moon to go from new moon to full moon. In this cycle, she travels her half circuit around the earth from high accelerated velocity ($13^d\ 22^h\ 21^m$), to slow ($15^d\ 14^h\ 18^m$), and back again to high. In 14 rounds she completes her cycle, which represents the moon's varying motion.[5] From age to age, in saecula saeclorum, she has kept up this 14-moon cycle, the periods varying slightly each moon, or month.

The Translation Cycle, under column 4, represents the actual time in days, hour, and minutes it takes the moon to go from conjunction, when she cannot be seen, to her phasis, or first appearance. The phasis always marked the sunset beginning of each new month for the nations using the luni-solar year. These translation periods also run in a 14-moon cycle, which follows fairly closely the longer waves of the moon from conjunction to opposition. When the moon is slow, then the translation period is long--over 3 days; when the moon is fast, her translation is short, usually a little over 1 day. The following Diagram C shows how closely these two cycles correspond:

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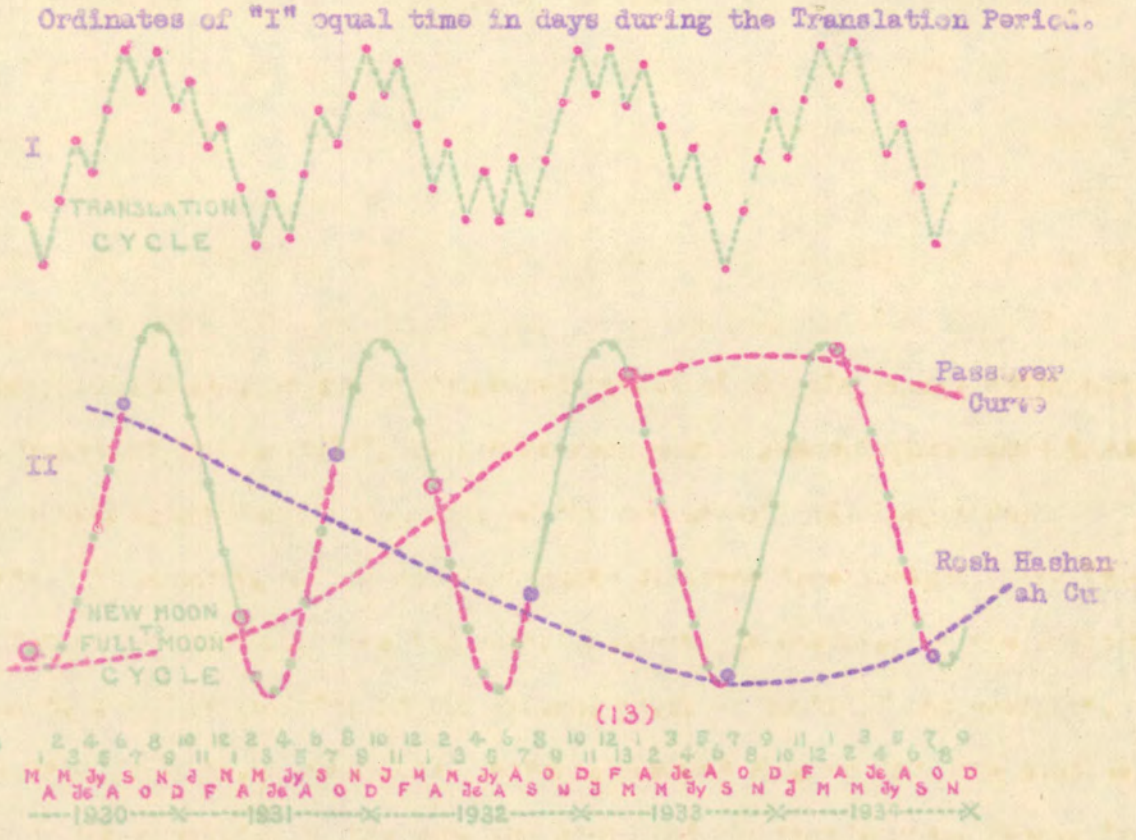
5 Diagram C represents but a small portion of a large lunar sine curve covering over 20 years, in which the Translation Cycle was figured according to Postulate I, Table V, and the full moon cycle as in Table IV. Both curves keep the same defined relation throughout, showing the influence of the same lunar motion upon each curve.

MOON'S CHANGING RATE OF MOTION

Each spot or point in "I" represents the Translation Period for the corresponding Jewish month.



Ordinates of "II" equal time in days from new moon to full moon.

Abscissae of "I" and "II" equal time of the lunar month of 29 and 1/2 days.

Each spot in "II" represents the time from new moon to full moon. The heavy red lines on the moon's curve correspond to the Jewish feast period from Nisan 1 to Tisri full moon.

The phases of the moon, from which the new-moon-to-full-moon periods were computed, were taken from the "American Ephemeris."

The figure "13" in red in the Jewish month tabulation, denotes an extra moon in the year 1932.

DIAGRAM C

THE MOON'S VARYING MOTION
(Controlling the Jewish Feasts)

In the phasis curve, we see the combined result of all the causes which conspire to hasten or retard the visibility of the nascent moon. Fotheringham names three causes as affecting the first appearance of the new moon:[6] (1) Longitude; (2) Latitude; (3) Anomaly, or the moon's angular distance from perigee. The longitude refers to the moon's distance from the vernal equinox, as measured on the ecliptic, and the latitude to her position in the zodiac, north or south of the ecliptic. Maimonides also gives these same three factors, summing them up into one conclusion--that "knowing the positions of the sun, the moon, and the moon's node, respectively, you have all necessary elements to establish by calculation whether the new moon will be visible or not."[7]

Hevelius has also left on record a complete description of the new moon and her phasis. He likewise presents the same three causes, though differently described, which result in the moon's visibility, early or late: (1) The obliquity of the

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[6] Fotheringham, "Date of the Crucifixion," Journal of Philology, (XXIX), 57. London, 1903, p. 105.

[7] Maimonides, quoted by Sidersky, "Chronology of the Jews," p. 668.

sphere leading to long or short settings; (2) the position of the conjunction, whether it is near the northern part of the zodiac or not; and (3) the relation of the moon to perigee; that is, her anomaly.[8] He names Pisces, Aries, and Taurus as being signs of long settings, and Virgo, Libra, and Scorpio as signs of short settings. Ferguson also testified the same when he said that the "ecliptic sets slowest in Aries, and fastest in Libra,"[9] a similar statement from Ferguson being printed in the Midnight Cry.[10] (We shall see this contrasting relation of the moon to these opposing signs--Aries and Libra--work out exactly as specified by astronomy in the event of the crucifixion and the October 22 date in 1844.) Hevelius further shows how these various causes or factors conform to the moon's motion:

"But if the causes mentioned as advancing the quick coming forth of the moon, do not always conspire, but even one is lacking, then on the next day after the interlunary period, this first phasis at length appears: but with two requisite causes absent, it can happen that finally the first phasis of the moon may fall in sight on the third day. But with all three conditions deficient, accelerating the rising of the moon. . . then this first appearance of the moon finally happens on the fourth day after conjunction with the sun."[11] [Italics mine.]

Then Hevelius adds the important observation that the "three requisite causes [for a quick phasis], as now told, commonly very rarely appear, so that the moon is in the signs of long settings [as in Aries], in perigee, and in the northern border, plainly in the time of conjunction or phasis."[12] Equally important is still another citation from the same paragraph that "the same rising of the moon does not commonly happen on the first day after the interlunary period [or. translation], but at length, on the second, often also on the third and fourth; this is plain to all observing her."

In harmony with this last statement, Scaliger shows that the Jews took a later moment for the moon's phasis:

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8 Hevelius, op. cit., pp. 274, 275.
9 Ferguson, op. cit., p. 244.
10 Midnight Cry, Apr. 20, 1844, p. 19.
11 Hevelius, op. cit., pp. 274, 275.
12 Hevelius, op. cit., p. 276.

"But the Jewish, Arabic, and Samaritan new moons usually exceed the size of the phasis [that is, the first slender streak of the moon] so that the civil new moons of the lunar months are of a triple kind: the Attic, as from conjunction; the Calippic from the waning of the moon; and the Jews, Samaritans, and Arabs from the 'shape' of the moon, from the third day, I say."[13]

With these two authorities on the moon's phasis, both Geminus in the first century B.C., and Hales in the 19th century, agree.[14]

The three causes of an early or late phasis, as given in the foregoing citations, have all entered into the visibility test for the first appearance of the moon after conjunction as outlined by those recently studying the computation of time in the first century.[15] But it is noticeable that in the results given, though many moons have been observed, a translation period extending to the 3rd or 4th day after conjunction is seldom seen. Usually the results are from 1 to 2 days--and thus are contrary to the testimony of Hevelius, Geminus, Scaliger, and Hales. The phasis often appears in the modern Jewish calendar even on the day of conjunction.[16] Questions have already arisen as to the validity of these visibility tests.[17]

One question yet remains to be answered: "On what day of Nisan shall we place the full moon dates belonging to the years of Christ's ministry?" The following table represents the new and full moons of the years 28 to 33 A.D., which embrace all the years within which the ministry of Christ is usually located.[18]

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13 Scaliger, "De Emendatione Temporum," pp. 6, 105. Scaliger also emphasizes the "horned moon" as characteristic of the Hebrew phasis (p.). Hevelius devotes a whole chapter to the "horned moon"--an older crescent shape--and shows how such a phasis is identified (pp. 281-284).

14 Hales quotes as follows from Geminus: "Geminus, a Grecian astronomer says, 'that when the moon is in perigee, and her motion quickest, she does not usually appear until the second day, nor in apogee when slowest, until the fourth.'" ("New Analysis of Chronology," Vol. 1, London, 1830, p. 67.)

15 Fotheringham, Schoch, Neugebauer, Gerhardt, and Schaumberger, among others.

16 See American Jewish Yearbook. Note: According to Sidersky, the Jewish calendar has an interval of 48 hours, or more, between conjunction and phasis, and provides for one or two days additional by its system of postponements, "the purpose of which is to retard by one or two days the official new moons." (Sidersky, op. cit., p. 64.) Thus the Jewish reckoning recognizes the full translation period as demanded by astronomy and history.

17 Dittrich, E., "The Death of Jesus of Nazareth," Astronomical News, Vol. 241, May, 1931. Note: Dittrich observes that the calendar and the position of of the moon do not agree in these tests.

18 The spring of 27 A.D. does not come into this list, because the baptism took place in the fall of the year. The dates in Diagram D were computed from Schram's tables by Associate Astronomer Glen Draper of the U.S. Naval Observatory, Washington, D.C., leading computer of the "American Ephemeris and Nautical Almanac."

DIAGRAM D

A.D.	New Moons	Feria	Full Moons	Feria	Jewish Time
28	Apr. 13 16^h 51^m	Tuesday	Apr. 27 12^h 23^m	Tuesday	Tuesday
29	Apr. 2 21 15	Sabbath	Apr. 17 12 1	Sunday	Sunday
30	Mar. 22 20 12	Wednesday	Apr. 6 20 9	Thursday	Friday
31	Apr. 10 14 51	Tuesday	Apr. 25 22 45	Wednesday	Thursday
32	Mar. 29 21 58	Sabbath	Apr. 14 11 39	Monday	Monday
33	Mar. 19 13 14	Thursday	Apr. 3 17 27	Friday	Friday

As shown in Part V. Sec. A, it makes a fundamental difference on what day of Nisan the full moon is placed. Throughout early patristic writings, the passover day is repeatedly called Luna 14, that is, the 14th day of the moon,[19] and it is clear from Moses[20] that this was also Abib (or Nisan) 14. Therefore, inasmuch as the extreme limits of the full moon cycle, in Table IV, extend from 13^d 22^h 21^m to 15^d 14^h 18^m,[21] and because the translation period itself, according to history, uses up from 1 to 3 full days, and some over, it would be impossible for the full moon to fall on any other than Nisan 13, and harmonize with these periods. If 1 day is taken from 13^d 22^h 21^m (the shortest period), the remainder coincides with Nisan 13; in like manner if 3 days are taken from the longest period, Nisan 13 is again proven.

In harmony with this, we have the testimony of Geminus, who definitely states that the earliest full moon comes on the 13th of the lunar month.[22] Aristobulos also maintained that the "day of the paschal festival began on the 14th of Nisan, after the evening when the moon stands diametrically opposed to the sun, as everyone can see at the time of full moon."[23]

The Arabs had special names for each series of three nights of every month, which were derived from the state of the moon and her light. The fifth three nights

19 Clavius, "Romani Calendarii Restituti Explicatio," p. 63.
20 Ex. 12:2.
21 Table IV.
22 Geminus, op. cit., p. 129.
23 Caspari, C.E., "Introduction to the Life of Christ" (trans. by Evans), Edinburgh, 1876, p. 9; Eusebius, "Ecclesiastical History," bk. VII, ch.XXXII.

LUNAR TRANSLATION FOR NISAN

POSTULATE 1

CONJUNCTION PASCHAL MOON ON NISAN 13 OPPOSITION

JERUSALEM CIVIL TIME

Place full moon date on Nisan 13, and count back to Nisan 1 and new moon date, the difference between which equals the Translation Period.

NEW MOON FULL MOON

Apr. 15 16h 51m Tu — Apr. 27 12h 23m Tu — 28 A.D.

Translation Period (Period between new and full moon)

Apr. 2 21h 15m Sa — Apr. 17 12h 1m Su — 29 A.D.

Mar. 22 20h 12m W — Apr. 6 20h 9m Th — 30 A.D.

CRUCIFIXION

FRIDAY, APRIL 27 31 A.D.

Apr. 10 14h 51m Tu — Apr. 25 22h 45m W — 31 A.D.

Mar. 29 21h 58m Sa — Apr. 14 11h 39m M — 32 A.D.

Mar. 19 13h 14m Th — Apr. 3 1?h 27m F — 33 A.D.

The new and full moon dates were computed from Schram's Tables by Glenn Draper, Associate Astronomer at the U.S. Naval Observatory, Washington, D.C.

(13-15) were called bid, because they were white by the light of the moon. The night between 13 and 14 is called badr, because in it the moon is full, and her light complete.[24]

2. Calculation of Moon's Phasis. According to ancient practice, and in harmony also with later testimony, the full moon is marked on the day of Nisan 13, as in Table IV, and the days are numbered back to Nisan 1. If the moon fulls between sunset and midnight, the full moon dates are placed early on the 13th of Nisan, between sunset and midnight. Now notice the year 33 A.D., in connection with the Table V, Postulate I. The full moon time was April 3, $17^h\ 27^m$ J.C.T. (Jerusalem Civil Time), on Friday. This means 5:27 P.M., Friday, April 3. The place of the moon is therefore marked near the sunset on that day, calling it Nisan 13. Then count back by common calendar days to Thursday, March 19, on the 13th hour of which is conjunction. Number the days forward to Nisan 1, which is Sunday. From the 13th hour on March 19 to the sunset beginning of Nisan 1 is the period from conjunction to phasis, known as the "translation period."[25] A glance shows this to be two whole days and a few hours over.

From the Nautical Almanac, the sunset time for March 21 is found, which coincides with the beginning of Nisan 1. This is 6:10 P.M.[26] From the 13th hour on March 19 to sunset at 6:10, beginning Nisan 1, are $2^d\ 4^h\ 56^m$ for the translation period of Nisan 1, in the year 33 A.D. This means that the full moon date in the year 33 A.D. was on Friday, Nisan 13, and that the passover day fell on Nisan 14, Saturday, April 4. Fotheringham also agrees with April 4, Saturday, as being the passover in 33 A.D.[27] The real error in Fotheringham's Table consists in the fact that his passovers in the years 28, 29, 31, and 33 are a month too early. On the other hand, a full moon as

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24 Albîrûnî, op. cit., pp. 6, 75.
25 Op. cit., p. 144.
26 The same sunset table for every year can be used because the longitude of the sun is marked from a fixed point on the ecliptic--the vernal equinox--which does not change.
27 Op. cit., p. 107.

early as April 3 could not be a barley-harvest moon in Judaea, and is therefore too early for the passover feast. A moon later places the passover in 33 A.D. on Sunday.

The same manner of figuring is operative for 30 A.D. The full moon date is after sunset of April 6, which in Jewish time is Friday, and which we must call Nisan 13 according to Poltulate 1. Saturday then becomes the Passover, on Nisan 14. So then the year 30 A.D. falls out, because Friday is Nisan 13 and not 14.[28] in that year. The years 32, 29 and 28 likewise fall out, because their passovers are on Tuesday, Monday, and Wednesday, respectively. And the year 33 A.D. is out, because Friday is Nisan 13.[29] This then leaves 31 A.D. as the only year within the period of Christ's public ministry with a passover on Friday. It came on April 27, Nisan 14--meeting all the requisite factors.

The translation period of the moon has been described again and again all through the Christian era, especially by the Jewish chronologists. Hevelius puts it this way:

"Quomodo vero haec observatio fuerit instituta, Rabbini eorum, & ex iis recentiores chronologi, abunde tradunt." (How this phasis [or observation] should be established, their Rabbins and their more recent chronologers abundantly report.)[30] [Italics mine.]

Possibly Hevelius was referring particularly to Maimonides, who lived in the early 13th century,[31] and worked out by spherical trigonometry the translation period of the moon.[32] This is not only based on higher mathematics, but also on the complex astronomy of the moon to which modern research testifies as the "deep things of astronomy." Nearly all the recent articles on the date of the crucifixion include a discussion of a simple form of Maimonides' complex figures, known as the "visibility test."

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[28] According to Neugebauer, the moon at this time in 30 A.D. was over 2 days old, in harmony with Table V. (Neugebauer, P.V., "Tafeln der Mondphasen," Leipzig, First Century.)

[29] Both Schoch and Fotheringham (op. cit., p. 107) place Friday, April 3, 33 A.D. on Nisan 13 by their tests for "visibility."

[30] Hevelius, Johannes, "Selenographia," Gedanum, 1647, p. 273.

[31] Maimuni's (Maimonides') "Neumondsberechnung," Teil III (trans. by Baneth), Berlin, 1902.

[32] His complicated problem has been translated into German by Baneth. Fotheringha J.K., Journal of Philology, (XXIX) 57, London, 1903, p. 107.

It would consequently seem as if the modern application of this Jewish secret makes the translation period in general too short. On this basis--that is, if we should shorten the translation periods say by one day--all the full moon dates on Table V would be thrust forward by one day, to Nisan 14; and, as Fotheringham complained in his application of the problem, there would be no Fridays in the series.[33] But this same plan of the full moon on Nisan 14 throws out the years 28 and 29, because in the case of 28 A.D., the translation period would be only about 1 1/2 hours; and for 29 A.D., 21 hours--both too short. Therefore such a hypothesis falls out--that is, that the full moon occurs on the passover day itself.

The postulate itself--that the full moon date must be placed on Nisan 13, in harmony with history--is thus its own proof; for it is the only position of the full moon providing sufficient time for a translation period of from 1 to 4 days. On the basis of this Postulate alone, astronomy can tie Jewish time to the Julian Calendar.

The translation period of the moon leading to Nisan 1, in the year 31 A.D., was $3^d\ 3^h\ 33^m$. This was one of the moon's long interlunary intervals. Not being the longest, it came well within the realm of historical testimony, which allows the moon from 1 to 4 days in which to appear after conjunction, and that "often also on the third and fourth day." This period of a little more than 3 days was but one of a cycle in which the moon's motion swings interminably fast and slow between her limits of acceleration. To the astronomer, the phasis of the moon on April 14, 31 A.D., was just an ordinary first appearance, more ordinary than as if her showing had been quick and rapid. But on April 25, Julian day number 1732495, toward midnight, the moon was in eclipse;[34] and on Friday, April 27, at noonday, the unaccountable darkness of the sun occurred, marking the approaching death of the Son of God.

The following vital facts in reference to the passover of the crucifixion are made known by this simple astronomical method of translating the moon of Nisan, as illustrated on Table V:

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33 Fotheringham, op. cit., p. 107.
34 Oppolzer, Th., Tables in "Denkschriften der kaiserlichen Akademie der Wissenschaften." Wien, 1887, p. 344, No. 1910.

1. Nisan 14 was Luna 14, the Passover Day.
2. Nisan 14 was the day after the fulling of the moon.
3. Nisan 14 was the crucifixion-Friday.
4. Therefore, according to Table V, the only day of the entire series that answered to all these stipulations was April 27, 31 A.D.

F. Translation of the New Moon for Tisri.

Early in the spring of 1843, as shown in Part II, the Millerites began to study the problem of the translation of the moon in relation to the calculation of the Jewish month and year. Finding in Ferguson's "Astronomy" a table of lunar conjunctions and phases for the time of Christ,[1] they printed it in the Midnight Cry of April 20, 1843, together with his description of the moon's position. In another edition of his "Astronomy," Ferguson makes the statement that the 14th day of the Jewish month answers to the 15th day of the moon,[2] and that consequently, the passover was always kept on the day of full moon. But in the table given in the Midnight Cry, the full moons were placed in various positions--on the 12th, 13th, and 14th of the Jewish month Nisan. On such a basis, all his translation periods could not but be irregular, and they would by no means correspond to the motion of the moon, which, if slow, requires more time for her phasis than when fast.

In the quotation given, Ferguson mentions the large angle which the ecliptic makes with the horizon in the spring (See Diagram D), and figures that at such a time, and in such a position, the moon would in 24 hours set about one hour later than the sun. Consequently--perhaps following the suggestion of Albîrûnî for a 24-hour translation constant (or mean period), as consistent with the Jewish computation--Ferguson's table was not very helpful to the Millerites in regard to the true translation period of the new moon, whose phasis was to mark the first day of a new month. Yet accuracy here was imperative if they were rightly to calculate Tisri 1, the 7th month for 1844.

Ferguson's table of the first-century spring moons was striking in that all the translation periods were short. It made all the new moons, but one, visible on the next day after conjunction.[3] In the paragraphs quoted from his "Astronomy,"

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1 Ferguson, "Astronomy," Vol. 1, par. 352. (Old Edition.)

2 Op. cit., (Edinburgh ed., 1811), p. 464. Note: This is contrary to Postulate 1, Table V, and to patristic testimony, which always called the paschal day, or Nisan 14, the 14th of the moon, i.e., "Luna 14."

3 Certain other computers, as Würm, Ideler, and Turner, use a constant period for translation, as suggested by Albîrûnî, on p. 68 of his "Chronology."

no mention was made of other important factors which control the translation of the moon, aside from her inclination and position in reference to the Zodiac. He gave the slowest moon of the series, as in the year 32 A.D., almost the same time for translation ($1^d\ 18^h\ 41^m$) as for the fastest moon, as in 28 A.D., for which his table allows $1^d\ 16^h\ 56^m$.[4] His exact table follows:[5]

"True time of conjunction at Jerusalem	d.	h.	m.	Moon visible at Jerusalem	Jewish full moon
"A.D. 28 Mar.	15	1	4 Morn.	Mar. 16.	Mar. 31. Wed.
29 Apr.	2	7	30 After.	Apr. 3.	Apr. 17. Sun.
30 Mar.	22	8	45 After.	Mar. 23.	Apr. 6. Thur.
31 Mar.	12	1	51 Morn.	Mar. 13	Mar. 27. Tues.
32 Mar.	29	11	19 After.	Mar. 31	Apr. 14. Mon.
33 Mar.	19	1	12 After.	Mar. 20	Apr. 3. Fri.
34 Mar.	9	5	12 Morn.	Mar. 10	Mar. 24. Wed."

As a matter of fact, Ferguson's first-century table--embracing the years of the 70th week--represents the very extremes of the moon's motion from new moon to full moon; that is, her fastest and slowest gait. Consequently, her translation periods should also correspond. Table V, on p.38a, shows the limits of translation in the years of Christ's ministry actually to be from $1^d\ 1^h\ 35^m$ for a fast moon, to $3^d\ 3^h\ 33^m$ for a slow one.

It was William Hales[6] who directed the Adventists to a source of authority on the phasis of the moon--to the "Isagogue" of the astronomer Geminus in the first century before Christ. Geminus taught that the earliest phasis of the moon is on the first day after conjunction, and the latest on the third or fourth. Scaliger also emphasized the third, as mentioned in Section E,[7] and Hevelius two to four days.[8] The error concerning the time of translation on the part of Ferguson, and the fact that he placed some of his passovers in March, too early for the barley-harvest, resulted in the ultimate rejection of his table by the Millerites, together

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4 Cf. table V on page 38a for the length of the moon's course.
5 Midnight Cry, April 20, 1843, p. 20.
6 Hales, "New Analysis of Chronology," London, 1830, Vol. 1, p. 67.
7 p. 37
8 p. 36

with his argument on the date of the crucifixion.[9]

In the early part of the 1844 movement, the leaders had started the year which they counted to be the last one of the 2300-year period, with the vernal equinox. This was the "Jewish sacred year 1843." But even before the vernal equinox of 1844 had passed, which they believed would close the Jewish year 1843, the Karaite teaching regarding the ancient Jewish mode of computing the moon's phasis, directed them to a closer study of the Jewish year, and its relation to the 2300-year prophecy, as noted in Part II, Sec. VI. Almost at the same time their attention was called to an autumnal ending for the prophetic year, as suggested by the 10th day of the 7th month--the Jewish day of Atonement and the Jubilee.[10] For this reason there does not seem to have been any attempt on their part to compute the translation period for the new moon of Nisan in 1844, although the Nisan conjunction was given in the Almanac as April $17^d\ 11^h\ 31^m$.

The Jewish date for starting another new month was also mentioned--this to correspond with the Karaite reckoning, the Rabbanite Nisan having been a month earlier, or in March. The whole attention was ultimately centered on the translation of the new moon of Tisri, upon a scientific basis, and upon one that would harmonize with the prophecy. The following statement from an editorial in the Midnight Cry, shows how closely the Adventists of that time reasoned in regard to the identity of the day, October 22:

"The new moon being probably seen in Judea on the second evening from its change, when it would be one day and 17 hours old, and which corresponded with 11 A.M. in Boston--strengthened us in our opinion that this must be the month."[11]

Before attempting to analyze the exact meaning of the quotation here given, it is essential to bear in mind just what is involved, astronomically, by the every-day language, "change of the moon." Though everyone uses this expression, it has direct application to certain astronomical events known as the four phases

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9 See Part II, Secs. VI, IX, and XII.
10 Lev. 23:27; 25:9.
11 Oct. 31, 1844, p. 141.

of the moon, which mark off her performance every 29 and 1/2 days. The new moon phase mentioned in the foregoing Midnight Cry editorial is, as noted, technically defined as conjunction, and represents that instant of time when the geocentric longitude of the sun and moon are equal, as measured from the center of the earth, the moon being between the earth and the sun.[12]

As has been stated, when the moon in her elliptical circuit is nearest the earth, she is said to be in perigee. Then her motion is rapid. When she is farthest away, as in apogee, then her motion is slow in relation to the earth. Her manner of travel, fast or slow, is most important as concerns calculation. In ancient times, this phenomenon was a guide in the starting of the Hebrew month,[13] and also came to the attention of the Millerites as an important factor to the translation of the moon as they were coming to their fundamental conclusions on the prophetic dates of the 2300-year period. As regards the real significance of conjunction, we should likewise understand that, being reckoned as from the center of the earth, this phase of the moon therefore represents that instant of time which would have a different local time designation for each longitude on the surface of the earth.

The quoted expression, "11 A.M. in Boston," in the foregoing reference, was obviously based on the difference in time between Boston and Jerusalem, which is 7 hours and 5 minutes.[14] No mention is made in the Midnight Cry or Advent Herald of an almanac for Jerusalem. In fact, it was said, "we have no certain means of knowing," when the Karaite passover month really commences there,[15] but the sunset time at Jerusalem on October 13 could well be considered near 6:00 P.M. If from this point of time, 7 hours are subtracted for the coincident time of Boston, the hour would be 11 A.M. To be exact, it would be 10:27 A.M.--if the true difference

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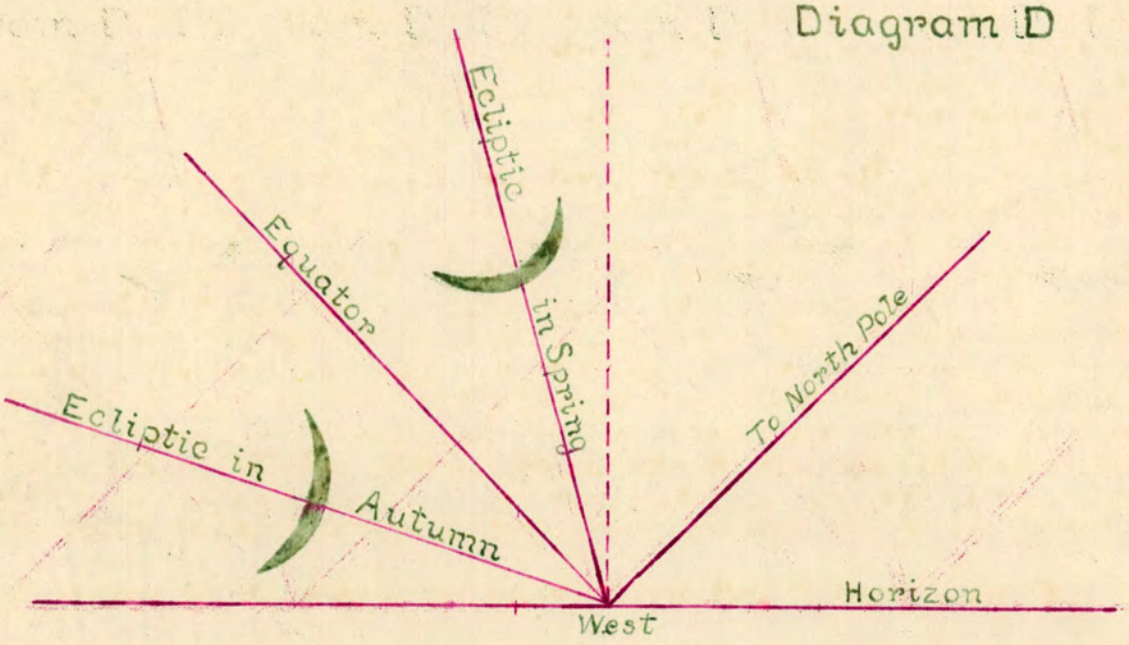
12 See "Conjunction," in Webster's International Dictionary.

13 Hales, ("Analysis of Sacred Chronology," Vol. 1, London, 1830, p. 67), includes a quotation from Geminus on the phasis of fast and slow moons.

14 The difference in hours between Boston and Jerusalem is the sum of $4^h\ 44^m\ 19^s$ (time of Boston, west from Greenwich) and $2^h\ 20^m\ 53^s$ (time of Jerusalem, east of Greenwich), or $7^h\ 5^m\ 12^s$.

15 Advent Herald, Sept. 11, 1844, p. 45.

Diagram D



POSITION OF THE NEW MOON AT THE EQUINOXES

"The significance of the crescent being shown as lying on its back is seen at once when it is remembered that the new moon is differently inclined to the horizon according to the time of year when it is seen. It is most nearly upright at the time of the autumn equinox; it is most nearly horizontal, "lying on its back," at the spring equinox."--Maunder, Walter E., "Astronomy of the Bible," p. 316.

"If the moon is some distance north of the sun at the time of new moon there will be a tendency towards an early phasis; if it be some distance south of the sun there will be a tendency towards a late phasis. If, again, the moon is near perigee it will move quickly; its right ascension and time of setting will advance rapidly, and there will be a tendency towards an early phasis; if it is near apogee, it will move slowly, and there will be a tendency towards a late phasis."--Fotheringham, J.K., Journal of Philology, Vol. XXIX, 1903, pp. 105, 106.

in time, or $7^h\ 5^m$, be subtracted from the exact sunset hour in Jerusalem, on Oct. 13, which, for 31 degrees north latitude, is authoritatively given as 5:32 P.M.[16] In either case, the argument and conclusion would be the same--the beginning of Tisri 1, in Jerusalem was on October 13, and the corresponding time in Boston was still the 13th.

In Boston, the new moon of October, 1844, in conjunction, occurred October 11, $18^h\ 40^m$, reckoned from midnight, or 6:40 P.M.[17] Being a fast moon--her time from conjunction to opposition (or full moon) took $14^d\ 5^h\ 30^m$, or less than the mean--and her motion increasing, for she was nearing perigee, she could be visible on October 12, right after sunset. To quote from Fotheringham, who has summed up the factors which come into play as regards an early or late phasis of the moon:

"If again, the moon is near perigee it will move quickly; its right ascension [or longitude] and time of setting will advance rapidly, and there will be a tendency towards an early phasis; if it is near apogee, it will move slowly, and there will be a tendency toward a late phasis."[18]

Fotheringham followed the rules of Hevelius, as may be seen from a scanning of the "Selenographia." He found that under favorable circumstances--as when the moon is fast and in perigee, and new early in the evening--she could be visible the following evening.[19] The conditions all conspired for a quick phasis of the new moon in October, 1844, so that in Boston she could be seen within 24 hours after conjunction. But because of the difference in time between Boston and Jerusalem, her crescent was not seen in Jerusalem until the following evening. (Diagrams E & F.) The quick phasis in Boston was an unusual translation. Hevelius declares that the causes for such a rapid lunar translation seldom occur together.[20]

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16 "American Nautical Almanac for 1939," p. 239.
17 Standard Almanacs for Britain, Germany, and France in 1844, as U.S. Nautical Almanac goes back only to 1858.
18 Fotheringham, J.K., Journal of Philology (XXIX) 57, 1903, p. 106.
19 Hevelius, "Selenographia," Gedanum, 1647, pp. 274, 275. novennium haec tria
20 Op. cit., p. 275. Note: Hevelius' exact words are (p. 276): "Etenim intra requisita vix una ingruent." (For within a period of nine years these three requisite [causes] with difficulty coincide.)

The Adventists understood at least some of the factors controlling a rapid phasis of the moon, hence the sunset of October 12--marking the beginning of October 13, Jewish time--was rightly fixed upon, in New England, as the proper instant for the first appearance of the new moon. The sunset on that day was at 5:26, in Boston,[21] and there were yet 10 minutes in which the young moon, nearly 24 hours old, could be seen, for she did not sink beneath the horizon until 5:36 P.M.[22]

A check was also made by the Millerites on this same conjunction in Jerusalem which was dated Oct. 12, $1^h\ 45^m$, or 7 hours and 5 minutes later. But there the moon could not be seen in so short a time as the first sunset after conjunction, which would be a period of only 15 hours and 48 minutes.[23] Therefore, the Adventists reasoned, the Jerusalem new moon would certainly be seen at the second sunset, which was nearly "one day and 17 hours" later than conjunction.[24]

The moon herself was scheduled to set soon after the hour of 6. Subtracting from this point of time the approximate difference in time between Boston and Jerusalem--that is, 7 hours--they arrived at 11 A.M. on the same October 13, as the coincident time of Boston. Diagrams E and F, which follow on p. 49, show this October conjunction in 1844, in its relation to these two cities:

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21 "American Nautical Almanac of 1939," p. 239. (Boston is 42° N. Latitude.)

22 "American Almanac," Boston, 1844.

23 Time from 1:45 A.M. on Oct. 12 to 5:33 P.M. at following sunset, Jerusalem.

24 Time from conjunction at 1:45 A.M. on Oct. 12 to moonset at 6:25 P.M. on Oct. 13, Jerusalem civil time. Moonset was computed from "British Nautical Almanac," 1844.

Had it been possible, in 1844, for one to telephone from Boston to the Patriarch in Jerusalem at sunset, on October 11, asking the time of day, he would have answered, "Yes, this is October 12, 1:45 A.M., and the moon is just now new; she is in conjunction"--except of course that the date would have been given in Jewish time. Let us therefore place, as in Diagrams E & F, the Boston P.M. clock along side the one in Jerusalem which is an A.M. clock, so that October 11, $18^h\ 40^m$ coincides with October 12, $1^h\ 45^m$, as the same instant of time.

From this point, mark off the days and sunsets for Boston and Jerusalem. Then note that every point of time in Jerusalem--as for instance midnight, ending Oct. 12--occurs 7 hours and 5 minutes earlier than the midnight ending Oct. 12, in Boston. Consequently, at sunset of October 12, in Jerusalem, because the new moon is too young to be seen, being only about 16 hours old, Tisri 1 begins the second sunset after conjunction. In contrast, Tisri 1 in Boston began the first sunset after the change. Therefore we see these first days of Tisri--the one in New England, and the other in Palestine--overlap each other for a period of nearly 7 hours. Diagrams E & F show the common instant of the two conjunction dates, the relation of the clock events of our civil time, and the position of the Jewish month Tisri in these two wide-apart places of the earth. This was understood and declared by the Millerites.

The translation of the moon was, in this instance of October 11 to 13, 1844, dependent upon the simplest of the principles which govern the moon's performance relative to the starting of the Jewish month. But the position of the moon was unusual in that her phasis in Boston occurred within 24 hours after conjunction. The scene at Jerusalem was carefully reconstructed by the Millerites, evidently to acquaint themselves with the inequalities of the moon in the land where God had said, "Observe the new moon,"[25] for the marking of their year and its holy feasts. It was right that they should do this, for Jerusalem is the prime meridian of ancient Jewish time, and of prophetic time. On October 13, in Jerusalem, the sun

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[25] Deut. 16:1.

set at 5:32, and at about 6:25 P.M. the moon also dipped below the horizon. So she was at least "one day and 17 hours old," as intimated in the reference from the Midnight Cry.

One more bit of evidence from this date offers itself to prove that in 1844 the right time was chosen for the phasis of the new moon of Tisri. In October, Jerusalem civil time, the full moon occurred on Oct. $26^d\ 7^h\ 26^m$. By placing this full moon date on Tisri 13, on the basis of the same postulate as for the Nisan moon, (See Part V, Sec. E), and marking off the calendar days, both Jewish and Gregorian, back to the beginning of Tisri--it can be noted that Tisri 1 began on sunset of October 13 in Jerusalem, which phasis, we have shown, corresponded to the phasis of October 12 in Boston. This check works both ways, so that the translation of the moon in 1844, for the meridian of Jerusalem confirms Postulate 1, which places the full moon on the 13th of the Jewish month.

Such was the problem that the earnest truth-seekers in 1844 faced and mastered. It was the harmonious conclusions of such precision in applied calendar science that "strengthened" them in their opinion that October 22 would be indeed the very 10th day of the 7th Jewish month Tisri. No other day could have answered the joint demands of the Scriptural law of the appointed feasts, the irregularities of the moon, the factors governing her translation, the undeviating course of the earth and sun, and the illusive geographical problem introduced by the difference in longitude between Boston and Jerusalem.

G. Summary of Conclusions.

1. Only by the true dating of the beginning and ending of Christ's public ministry is it possible to determine the correct chronology of the full 2300-year prophecy, and the related events of history.

2. The Jewish calendar of today--man's most complex system of computing time, and described by Joseph Scaliger as the "most ingenious and beautiful of all

systems"--is evidence of early Jewish development of a dependable method of reckoning time, in harmony with known and fundamental principles of astronomy and chronology.

3. Through the principles of astronomy and calendrical science, we are able to tie Hebrew time reckoning in the first century to the current Julian calendar of the Romans.

4. By a correlation of astronomical science, Biblical specification, and historical record, the disputed date of the crucifixion has been determined.

5. By means of this correlation, (a) the true placement of the paschal month Nisan, and (b) the date of the true paschal day (Nisan 14) have been shown.

6. Friday, April 27,, 31 A.D., Julian time, has been demonstrated to be the only date during the public ministry of Christ which satisfies (a) the Bible requirement for a Friday-passover crucifixion and (b) the definite demands of astronomy for the corresponding coincident positions of sun, moon, and earth.

7. The complementary relation between the crucifixion on April 27, 31 A.D. and the great antitypical Day of Atonement ushered in on October 22, 1844, at which time the 2300-year period ended, has likewise been demonstrated.

Grace Edith Amadon

JEWISH FEAST CYCLE (1843 and 1844)*
(Boston Civil Time)

	1 Jewish Month		2 New Moon		3 Full Moon	4 Festivals	5 Moon's Time	
	10	Tebet	Dec. 31	to Jan. 16			=15d-13h- m	
1843	11	Sebat	Jan. 30	" Feb. 14			=15 - 8 8	
	12	Adar	Mar. 1	" Mar. 16			=14 -23 -56	
	1	Nisan	Mar. 30	" Apr. 14		Passover	=14 -40 -40	
MOSAIC	2	Iyar	Apr. 29	" May 13		(Apr. 14 = Nisan 14)	=14 - 6 -15	172 days
	3	Sivan	May 29	" June 12			=14 - 0 -16	between
also	4	Tammuz	June 27	" July 11			=13 -21 -45	Passover
	5	Ab	July 27	" Aug. 9			=13 -23 -11	1843 and
Rabbinical	6	Elul	Aug. 25	" Sept. 8		Tisri 10	=14 - 4 -22	Atonement
	7	Tisri	Sept.23	" Oct. 8		=Oct. 4	=14 -12 -23	
	8	Ḥesvan	Oct. 23	" Nov. 7			=14 -21 -46	
	9	Kisleu	Nov. 21	" Dec. 6			=15 - 6 -27	
	10	Tebet	Dec. 21	" Jan. 5			=15 -12 -25	
1844	11	Sebat	Jan. 19	" Feb. 4		Rabbinical	=15 -14 -24	
	12	Adar I	Feb. 18	" Mar. 4		Passover	=15 -12 -16	
	13	Adar II	Mar. 18	" Apr. 3		April 4	=15 - 6 -40	
	1	Nisan	Apr. 17	" May 2		Passover	=14 -22 -43	172 days
	2	Iyar	May 17	" May 31		(May 2 = Nisan 14)	=14 -13 -53	between
MOSAIC	3	Sivan	June 15	" June 30			=14 - 5 -50	Passover
only	4	Tammuz	July 15	" July 29			=14 - 0 -10	1844 and
	5	Ab	Aug. 13	" Aug. 27			=13 -22 - 2	Atonement
	6	Elul	Sept.12	" Sept.26		Tisri 10	=13 -23 -57	
	7	Tisri	Oct. 11	" Oct. 26		=Oct. 22	=14 - 5 -41	
	8	Ḥesvan	Nov. 10	" Nov. 24			=14 -14 - 5	
	9	Kisleu	Dec. 9	" Dec. 24			=14 -23 -16	

172 d. ↔ 172 d.

EMBOLISMIC

* Moon's phases computed from the British Nautical Almanac

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The spring of 1843 offers only one date that can possibly correspond to the new moon of Nisan -- March 30. From this spring moon, the Jewish year in 1843 began, the Passover coming on April 15, and after 172 days, Tisri 10 coming on October 4. Column 2 shows that the time from March 30 (the first new moon after the vernal equinox in 1843), to March 18, inclusive, the last new moon before the vernal equinox in 1844), is exactly 13 moons. In order to coalesce with the extra moon, the Jewish year should intercalate a second Adar, whose full moon would then come on April 3, 1844. This Adar moon could not be the Mosaic paschal moon, for it is too early--the latter rain not yet being ended, and the barley corn not yet being ripe in Palestine. Hence the next new moon, whose conjunction is on April 17, must mark the month Nisan in 1844. The Passover would therefore come on May 3, the day following full moon; and the Tisri new moon would of necessity fall in October, the day of atonement coming on October 22 at the end of 172 days from Passover. The one place for the new moon of Nisan on March 30, 1843, and also of the full moon of April 3, 1844--which must belong to Adar because it is too early for Nisan--represent two fixed positions of the moon that exactly determine the date of Tisri 10 in 1844 to be the 22nd day of October.